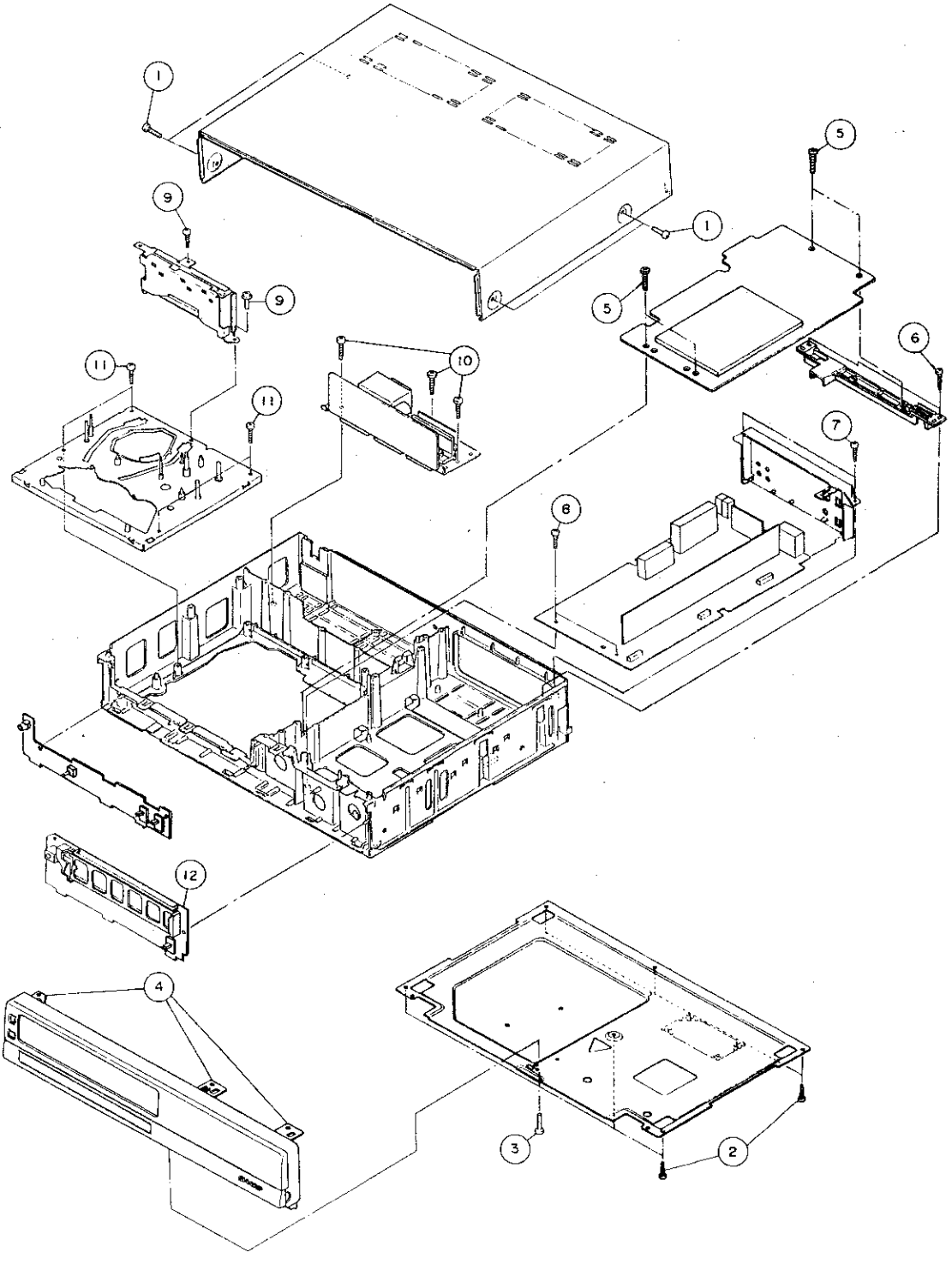
SHARP VC-D805H

MODEL

SERVICE MANUAL

DISASSEMBLY AND REASSEMBLY

1. Remove the four upper cabinet fastening screws ①.
2. Remove the six bottom panel fastening screws ②.
3. Remove the one front panel fastening screw ③.
4. Release the three clips ④ and remove the front panel.
5. Remove the four digital PWB fastening screws ⑤.
6. Remove the two digital PWB holder fastening screw ⑥.
7. Remove the two antenna terminal cover fastening screws ⑦.
8. Remove the two main PWB fastening screws ⑧.
9. Remove the two head amp PWB fastening screws ⑨.
10. Remove the three power unit fastening screws ⑩.
11. Remove the four machanism chassis fastening screws ⑪.
12. Release the timer PWB fastening clips ⑫.

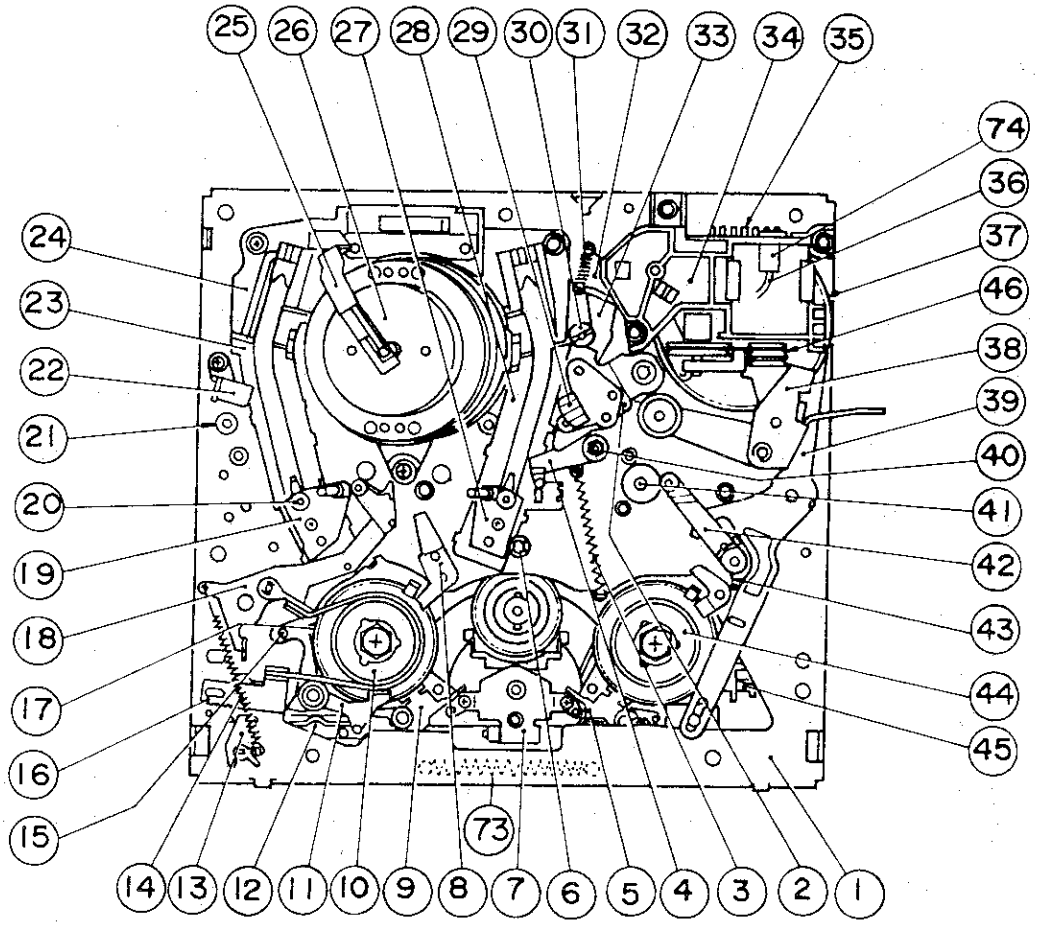


LOCATION LIST OF MECHANICAL PARTS

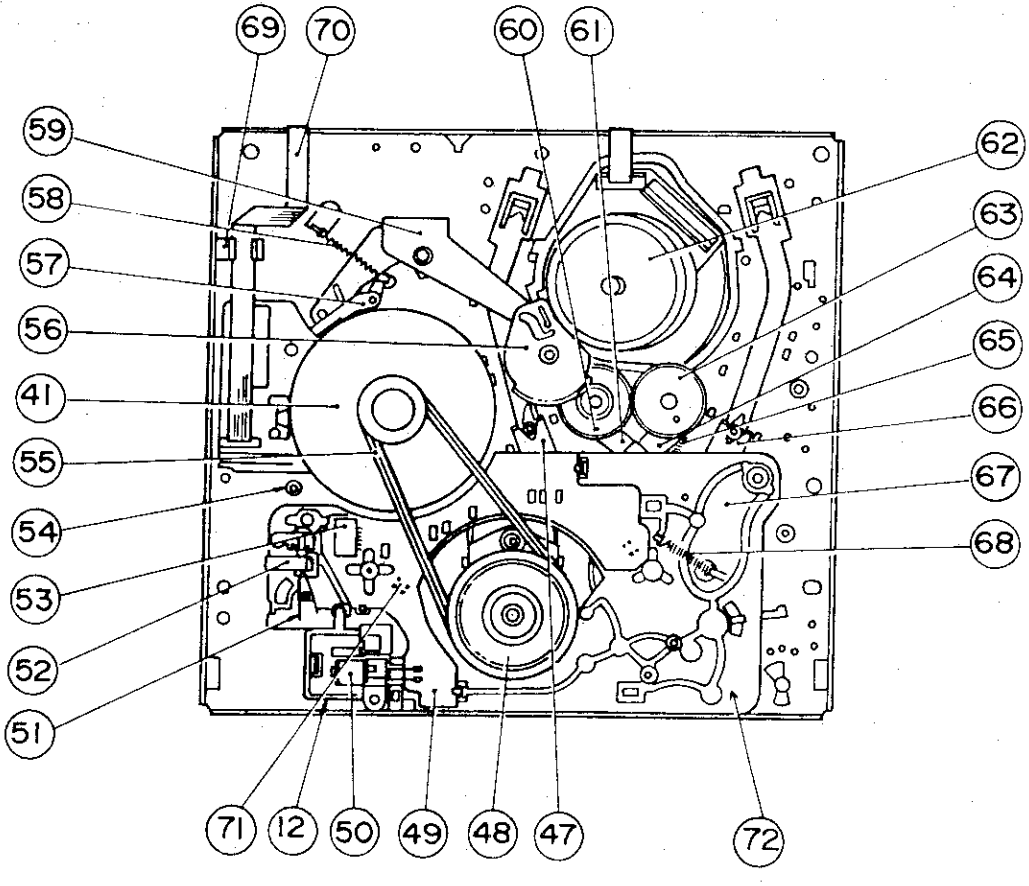
No.	Part Name	No.	Part Name
1	Main chassis ass'y	38	Pinch roller lever ass'y
2	A/C head arm	39	Relay shifter lever
3	Half-loading lever spring	40	Retaining guide
4	Half-loading lever	41	Capstan D.D.motor
5	Main take-up brake lever	42	Reverse guide
6	Cassette LED	43	Reverse guide spring
7	Idler gear ass'y	44	Take-up reel disk
8	Cassette control earth spring	45	Video search brake lever
9	Main supply brake lever	46	Loading belt
10	Supply reel disk	47	Take-up pole base slider
11	Back tension lever	48	Reel pulley
12	Brake shifter	49	Reel sensor PWB
13	Tension spring hook plate	50	Brake solenoid
14	Tension spring	51	Shifter spring
15	Tension release lever	52	Shifter spring cover
16	Tension band ass'y	53	Connector
17	Auxiliary fast forward brake lever	54	Reverse guide spring
18	Tension arm ass'y	55	Reel belt
19	Supply pole base ass'y	56	Loading relay gear
20	Guide roller ass'y	57	Slow brake lever
21	Supply impedance roller	58	Slow brake spring
22	Full erase head ass'y	59	Relay gear drive lever
23	Supply loading rail	60	Take-up loading gear
24	Drum base	61	Take-up loading arm ass'y
25	Earth brush ass'y	62	Drum D.D. motor ass'y
26	Drum ass'y	63	Supply loading gear
27	Take-up pole base ass'y	64	Supply loading arm ass'y
28	Take-up loading rail	65	Loading reciprocating spring
29	A/C head ass'y	66	Supply pole base slider
30	X-position adjusting nut	67	Reel block chassis
31	Half-loading reciprocating spring	68	Auxiliary fast forward brake spring
32	Half-loading reciprocating lever	69	Full flat cable holder
33	Half-loading drive lever	70	Full flat cable(Drum D.D. motor)
34	Loading block ass'y	71	Reel sensor
35	Cam switch	72	Reel block
36	Loading motor	73	Main brake spring
37	Master cam	74	Dew sensor

LOCATION OF MECHANICAL PARTS

- TOP VIEW



- BOTTOM VIEW



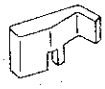
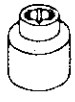
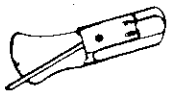
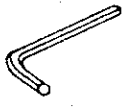
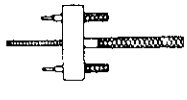
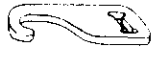
ADJUSTMENT, REPLACEMENT, ASSEMBLY AND CLEANING OF MECHANICAL UNITS

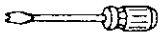
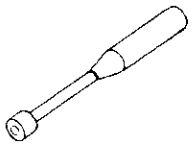
Here we will describe a relatively simple service work in the field, not referring to the more complicated repairs which would require the use of special equipment and tools (drum assembly or replacement, for example).

We are sure that the easy-to-handle tools listed below would be more than handy for periodical maintenance to keep the machine in its original efficient condition.

TOOLS NECESSARY FOR ADJUSTING THE MECHANICAL UNITS

The following tools are required for proper service and satisfactory repair.

No.	Jig Item	Part No.	Code	Configuration	Remarks
1	Reel Disk Height Adjusting Jig	JiGRH0002	BR		These Jigs are used for checking and adjusting the reel disk height.
2	Master Plane Jig	JiGMP0001	BY		
3	A/C Head Tilt Adjusting Jig	JiGACH-F18	BU		This Jig is used for settimg the A/C head tilt.
4	Torque Gauge (90g)	JiGTG0090	CM		These Jigs are used for checking and adjusting the torque of take-up and supply reel disks.
	Torque Gauge (1.2 kg)	JiGTG1200	CN		
5	Gauge Head	JiGTH0006	AW		
6	Cassette Torque Meter	JiGVHT-063	CZ		This cassette torque meter is used for checking and adjusting the torque of take-up and supply reel and for measuring tape back tension.
7	Tension Gauge (300g)	JiGSG0300	BF		There are two Gauges used for the tension measurements, 300 g and 2.0 kg.
	Tension Gauge (2.0 kg)	JiGSG2000	BS		
8	Hex Wrench (0.9 mm)	JiGHW0009	AE		These Jigs are used for loosening or tightening special Hexagon type screws.
	Hex Wrench (1.2 mm)	JiGHW0012	AE		
	Hex Wrench (1.5 mm)	JiGHW0015	AE		
9	Alignment Tape (PAL)	VROCPSV	CK		This tape is especially used for electrical fine adjustment.
10	Drum Replacing Jig	JiGDT-0001	BG		This is used for replacement of the VCR's upper drum.
11	Tension Gauge Adapter	JiGADP003	BK		This Jig is used for the tension gauge. Rotary Transformer Clearance Adjusting Jig.

No.	Jig Item	Part No.	Code	Configuration	Remarks
12	Special Bladed Screwdriver	JiGDRiVERH-4	AP		This Screwdriver is used for adjusting the guide roller height and X-position.
13	Tension Band and Plate Adjusting Jig	JiGDRiVER-6	BM		This Jig is used for adjusting the tension band and tension plate.
14	Torque Driver	JiGTD1200	CB		This is used to screw down resin-made parts: the specified torque is 5 kg.
15	Box Driver	JiGDRiVER110-7	AS		This Jig is used for height adjustment of the A/C head.
		JiGDRiVER110-4	AV		This Jig is used for height adjustment of the retaining guide.
16	Retaining Guide Height Adjusting Jig	JiGGH-F18	BU		This Jig is used for height adjustment of the retaining guide.
17	Reverse Guide Height Adjusting Jig	JiGRVGH-F18	BU		This Jig is used for height adjustment of the reverse guide.

NOTE:
Current JiGMA0001 contains Master Plane (JiGMP0001) and Disk Height Adjusting Jig (JiGRH0001). Even though new Disk Height Adjusting Jig (JiGRH0002) covers greater height, this new Jig (JiGRH0002) can be used for current JiGRH0001, but current Jig (JiGRH0001) cannot be used as JiGHR0002.Master Plane (JiGMP0001)can be used with JiGRH0001 and JiGRH0002 as well.

MECHANICAL PARTS REQUIRING PERIODICAL INSPECTION

Use the following table as a guide to maintain the mechanical parts in good operating condition.

Parts \ Maintained every	500 hrs.	1000 hrs.	1500 hrs.	2000 hrs.	3000 hrs.	Remarks
Guide roller ass'y	□	□	□	□	□	Abnormal rotation or significant vibration requires replacement.
Supply impedance roller	□	□	□	□	□	
Supply impedance roller (inner)		□		□	□	Clean with pure high quality isopropyl alcohol.
Supply impedance roller flange	□	□	□	□	□	Clean tape contact area with the specified cleaning liquid.
Retaining guide	□	□	□	□	□	
Slant pole	□	□	□	□	□	
Video head	□	○□	□	○□	○□	Clean tape contact area with the specified cleaning liquid.
Full-erase head	□	□	□	□	□	
A/C head	□	□	□	□	□	
Pinch roller	□	□	□	□	○□	Clean rubber and rubber contact area with the specified cleaning liquid.
Reel belt		□		□		
Loading belt		□		○		
Capstan loading belt		□		○		
Reel block*				○		
Tension band ass'y					○	
***See the table below for servicing the reel block parts.**						
Supply/take-up reel disks		□ △		□△○		Clean with pure high quality isopropyl alcohol.
Video serch brake lever				○		
Idler gear ass'y				○		
Reel idler		□△		□△		
Main supply/take-up brake levers				○		

NOTE: ○: Part replacement.
□: Cleaning (For cleaning, use a lint-free cloth dampened with pure isopropyl alcohol).
△: Oil refilling (The indicated point should be lubricated with high quality spindle oil every 1000 hrs).

This model has no adjusting parts for torques, tension, etc. If the reading is outside the specified range, clean or replace the part.

REMOVAL AND REASSEMBLY OF CASSETTE HOUSING CONTROL ASSEMBLY

Notes:

1. During removal and reassembly, be careful not to strike the nearby guide pin, drum, etc.
2. Before removal or reassembly, be sure to unplug the recorder from the AC outlet.
3. When removing and attaching the cassette loading belt, be careful to keep it free from grease.

- **Removal**

1. Put the unit in the cassette eject position.
2. Remove the cassette loading belt ① .
3. Disconnect the FFC (Full Flat Cable) ② at the right side of the cassette housing control assembly.
   Note: Be careful not to break the FFC.
4. Remove the two cassette housing installation screws.
5. Move the cassette housing control assembly (Fig. 1-1) in the direction of arrow ➡ Ⓑ, and pull it out straight upward.

- **Reassembly**

1. Insert the tabs of the cassette housing control assembly into the mechanism chassis, move it in the direction of arrow ➡ Ⓐ, and secure temporarily.
   Check to see if the cassette housing control assembly is in the correct position, and then tighten the two screws (XHPS330P06WS0) .
2. Attach the cassette loading belt ① .
3. Connect the FFC ② at the right side of the cassette housing control assembly.

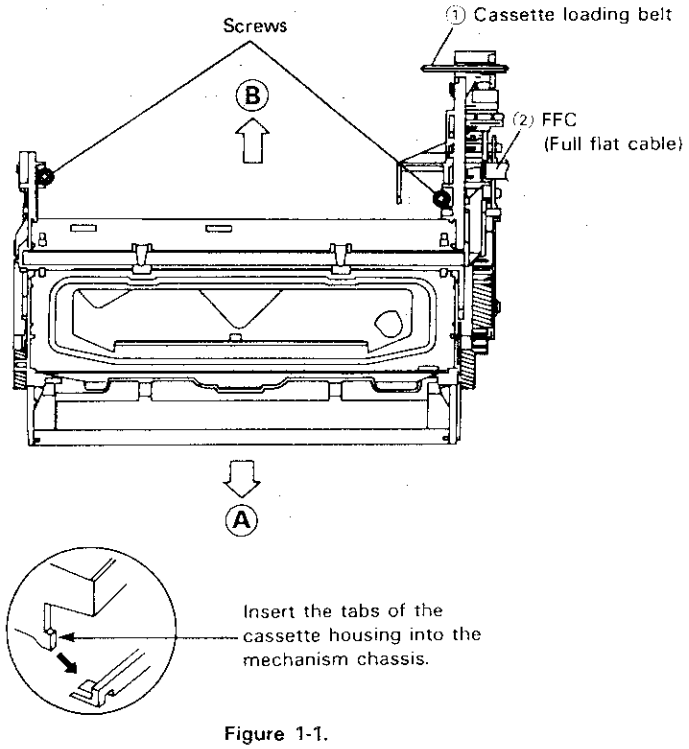


Figure 1-1.

REPLACEMENT OF WORM WHEEL ASSEMBLY

- **Removal (Fig. 1 - 2)**

1. Unsolder the cassette switch connector from the start sensor PWB ①
2. Release the two catches Ⓐ on the cassette housing frame (R), and remove the PWB.
3. Unscrew one B tight screw ② to detach the worm bracket ③.
   Note: The bearing ④ can come off position too. So be careful not to let the bearing fall.
4. Remove the worm shaft assembly ⑤, pulley ⑥ and cassette loading belt ⑦ all from the cassette housing frame (R).
5. Finally pull the worm wheel assembly out of the boss of the cassette housing frame (R).

- **Reassembly (Fig. 1-2)**

1. Turn the phase gear ⑧ clockwise until the slider comes to a halt in the cassette insertion direction.
2. Set up the worm wheel gear assembly onto the boss on the cassette housing frame (R), matching the mark Ⓖ on the phase gear ⑧ with the mark Ⓗ on the worm wheel gear.
   Note: Make sure that the slider pin is in the groove of the drive gear arm.
3. Install the pulley ⑥ and apply the cassette loading belt ⑦ both on the worm shaft assembly ⑤ Couple the clutch ⑩ to the clutch lever ⑨. And mount them together in the cassette housing frame (R) .
4. Attach the worm bracket ③ to the worm shaft assembly ⑤. Place them onto the boss on the cassette housing frame (R).
5. Tighten one B tight screw ②.
   Note: Make sure that the parts Ⓒ and Ⓓ of the cassette housing frame (R) are properly engaged with the parts Ⓔ and Ⓕ of the worm bracket ③.
6. Hook the start sensor PWB① on the two positions Ⓐ on the cassette housing frame (R).
   Note: Check that the switch connector is right in the cassette switch mounting hole Ⓑ.
7. Finally resolder the cassette switch connector to the start sensor PWB.

Notes:

1. Do not overtighten the B tight screw (no more than 5.0 ± 0.5 kg. cm), because otherwise the lower threads of the screw hole at the resin-made boss may be broken.
2. Keep in mind that the clutch switching lever should be in the correct positional relation. The mechanism might malfunction even if the lever comes slightly out of position.

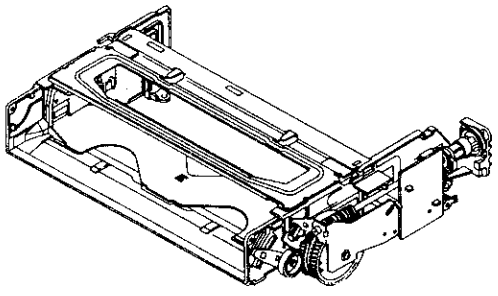


Figure 1-2 (a).

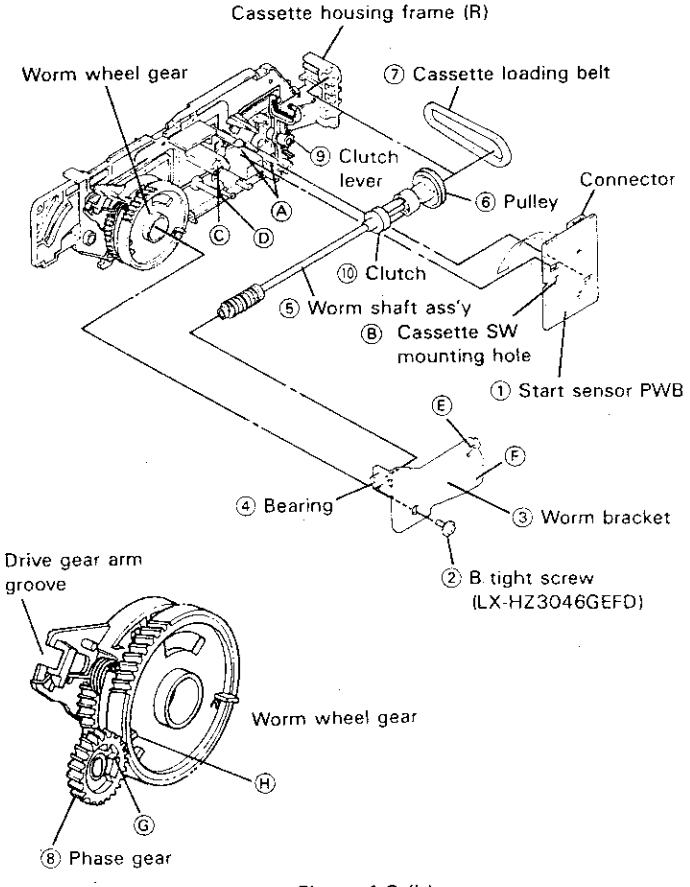


Figure 1-2 (b).

- **Reassembly of drive gear (Fig.1- 3)**

1. Pass the tip Ⓑ of the drive gear spring (R) ② through the square hole Ⓐ of the drive gear (R) ① to the hook the spring in position.
2. Hook one end Ⓓ of the reciprocating spring ③ to the catch Ⓒ of the drive gear (R) ①.
3. Hook the other end Ⓔ of the reciprocating spring ③ to the catch Ⓕ of the worm wheel ④.
4. Fit the drive gear (R) ① to the worm wheel ④ so that the catch Ⓖ and boss Ⓙ on the drive gear (R) are exactly in the square hole Ⓗ and round hole Ⓘ, Respectively, in the worm wheel.

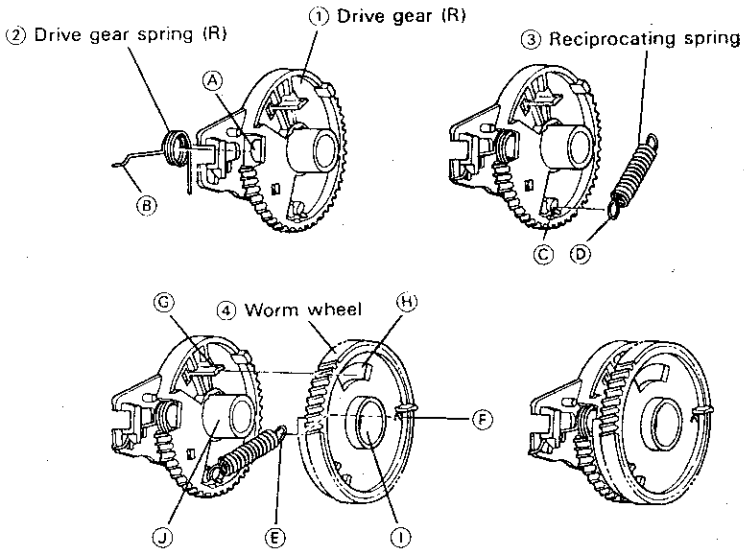


Figure 1-3.

REPLACEMENT OF CASSETTE LOADING BELT

- **Replacement (Fig. 1-4)**

1. Remove the start sensor PWB and worm bracket from the cassette housing frame (R).
2. Remove the worm shaft assembly, pulley and cassette loading belt from the cassette housing frame (R).
3. Replace the cassette loading belt with a new one.

Notes:

1. Do not overtighten the B tight screw which holds the worm bracket in position. The specified tightening torque is 5.0 ± 0.5kg. cm.
2. Make sure that the cassette loading belt, being applied in the cassette housing frame (R), is free from grease. If stained with grease, clean the belt with the specific cleaning liquid.
3. Finally check the clutch switching lever for its specified points.

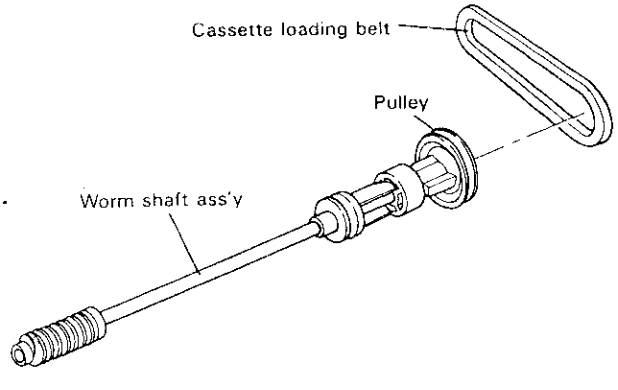


Figure 1-4.

CHECKING THE CLUTCH SWITCHING LEVER

- **Checking (Fig. 1-5)**

When removing and attaching the clutch switching lever from and to the mechanism chassis, check to see if the lever is in the position as shown below. If out of this position, malfunction might result.

1. First make sure that the rib Ⓐ of the drive gear (R) ① and the tip Ⓑ of the switch lever ② are in their correct positions.
2. Check also that the rib Ⓒ of the cassette housing frame (R) and the catch Ⓓ of the clutch lock lever ③ are in their proper positions.
3. Finally be sure that the positional relations between the clutch lever ④ and the clutch ⑤, as well as between the clutch ⑤ and the pulley ⑥, are as specified.

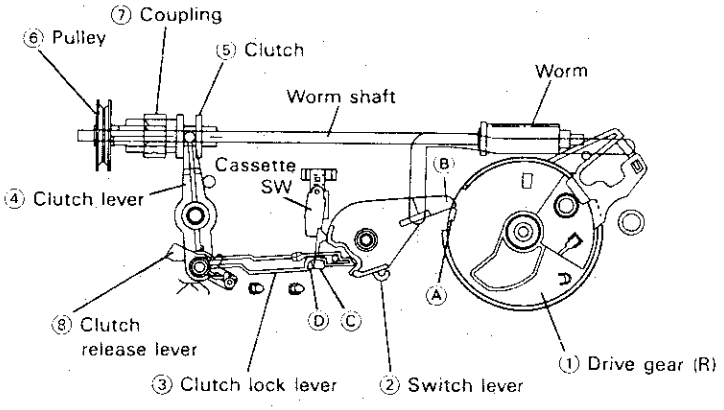


Figure 1-5.

- **Resetting (Fig. 1-6)**

Take the following steps to reset the clutch ⑤ if it is unlocked or if the switch lever ② and clutch lock lever ③ are unlocked.

1. Turn the coupling ⑦ clokwise (as viewed from the front of the set) until the slider comes to the position indicated below.
   Note: Notice that the slider is equipped with a lock mechanism. Unlock the slider, therefore, before shifting the slider.

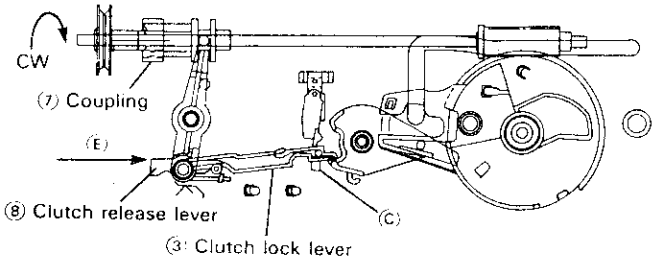


Figure 1-6.

2. Now push the clutch release lever ⑧ in the direction of arrow Ⓔ by hand until the clutch lock lever ③ becomes tightly locked by the part Ⓒ of the cassette housing frame (R).
3. Then turn the coupling ⑦ counterclockwise until the slider reaches the cassette insertion opening and the reciprocating spring is activated.
   Note: There is no need to lock the slider. Just keep shifting the slider.

REPLACEMENT OF LOCK RELEASE LEVER

- **Removal (Fig. 1-7)**

1. Turn the coupling clockwise until the slider ① comes to the cassette down position.
   Note: Before shifting, unlock the slider.
2. Slightly widen the cassette housing frames (R) and (L) to unhook the parts Ⓐ of the slider holders (R) and (L) off the grooves of the above frames.
3. Press the catch Ⓑ on the slider holder (R) ②, and let the slider ① go off this holder in the direction of arrow Ⓒ.
4. Take the lock release lever ③ out of the slider holder (R) ②.

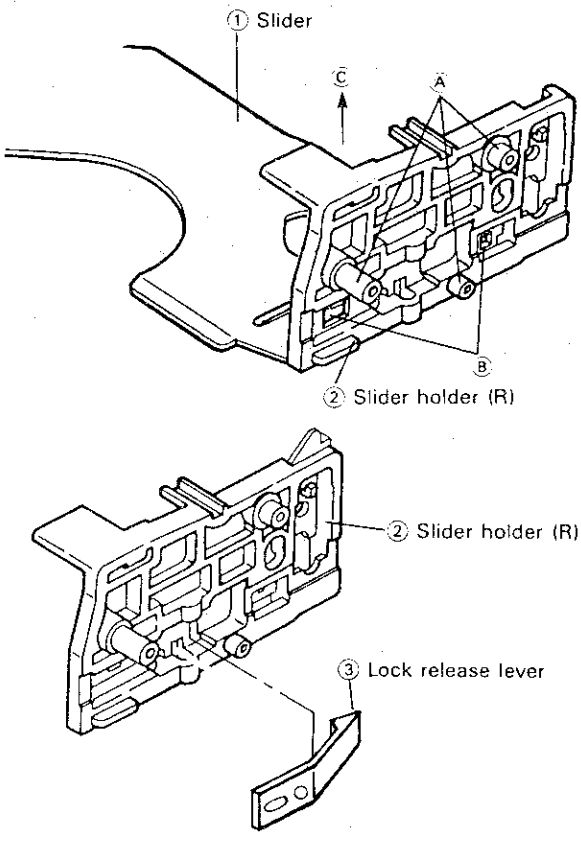


Figure 1-7.

- **Reassemdly (Fig. 1-7)**

1. Attach the lock release lever ③ to the slider holder (R) ②.
2. Fit the slider holder (R) ② to the slider ①.
3. Slightly widen the cassette housing frames (R) and (L), and set the parts Ⓐ of the slider holders (R) and (L) to the grooves of the cassette housing frames (R) and (L).
   Note: Make sure of the following fitting: Fitting between the parts Ⓐ of the slider holders (R) and (L) and the grooves of the cassette housing frames (R) and (L), as well as between the drive gear arms and the slider holders (R) and (L).
4. Turn the coupling counterclockwise until the slider ① comes to the cassette insertion opening.

TO RUN A TAPE WITHOUT THE CASSETTE HOUSING CONTROL ASSEMBLY

1. Open the lid of a cassette tape by hand and hold it with a piece of vinyl tape.
2. Set the cassette tape in the tape mechanism.Then, stabilize the cassette tape with a weight (500g or less).
   Note: The weight should not be more than 500g.

REMOVAL AND HEIGHT ADJUSTMENT OF REEL DISKS

- **Removal of supply reel disk:**

1. Remove the cassette housing control assembly.
2. Set the mechanism in the playback mode with no cassette tape in place. Unplug the power cord.
3. Remove the tension band ⑧.
4. Unscrew the screw ⑩ and release the cassette housing control ground spring ⑫ off the reel disk catch ①.
5. Release the supply reel disk catch ① and back tension lever ②. Pull out the supply reel disk ③ upward.

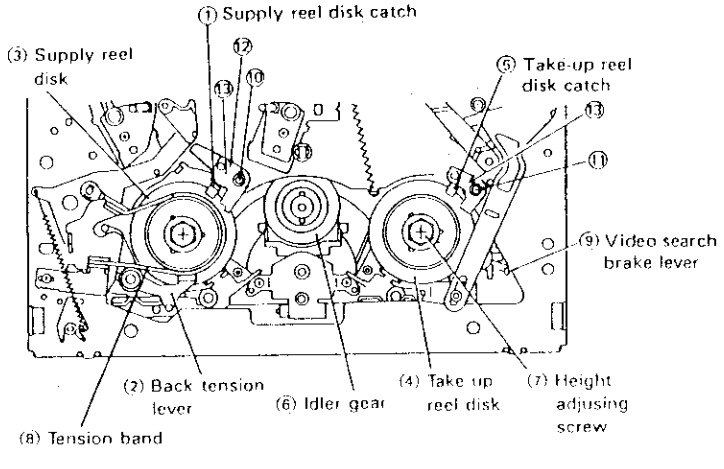


Figure 1-8.

- **Removal of take-up reel disk:**

1. Remove the cassette housing control assembly.
2. Set the mechanism in the playback mode with no cassette tape in place. Unplug the power cord.
3. Unscrew the screw ⑪ and release the take-up reel disk catch holder ⑬ off the reel disk catch ⑤.
4. Release the take-up reel disk catch ⑤. Pull out the take-up reel disk ④ upward.

Notes:

1. After replacing either of the reel disks, be sure to perform the height adjustment procedure.
2. Take care not to deform the tension hand.
3. Be careful not to deform the back tension lever, main supply / take - up brake levers, video search brake lever and auxiliary fast forward brake. (See pages 4 and 5.)
4. Check the tension pole position. (See page 15.)
5. Be careful not to damage the supply reel disk, take-up reel disk and idler gear ⑥.
6. Whenever replacing, clean and lubricate the reel disk shaft.

- **Reassembly of supply reel disk:**

1. Clean the reel disk shaft and apply oil (high quality spindle oil) to it, then install a new supply reel disk onto the shaft.
2. Replace the cassette housing control ground spring ⑫ in position and tighten up the screw ⑩.
3. Replace the tension band ⑧.
4. Adjust the reel disk height by using the master plane and reel disk height adjusting jig.

- **Reassembly of take-up reel disk:**

1. Clean the reel disk shaft and apply oil (high quality spindle oil) to it. Then, release the video search brake lever and install a new take - up reel disk onto the shaft.
2. Replace the take-up reel disk catch holder ⑬ in position and tighten up the screw ⑪.
3. Adjust the reel disk height by using the master plane and reel disk height adjusting jig.

Notes:

1. During removal and reassembly, be careful not to damage the reel disks, reel shafts, idler gear and brake levers.
2. After reassembly, check the back tension in video search rewind mode (see page 14) and checking the brake torque (see page 16)

HEIGHT ADJUSTMENT

1. Remove the cassette housing assembly, and place the master plane onto the mechanism unit as shown in Fig.1-9 (a), taking care not to hit the drum.
2. Ensure that the reel disk is lower than the part Ⓐ but higher than the part Ⓑ of Fig. 1-9 (b), by using the reel disk height adjusting jig. If the height is not correct, adjust the height adjusting screw.

Note: Whenever replacing the reel disk, perform the height adjustment.

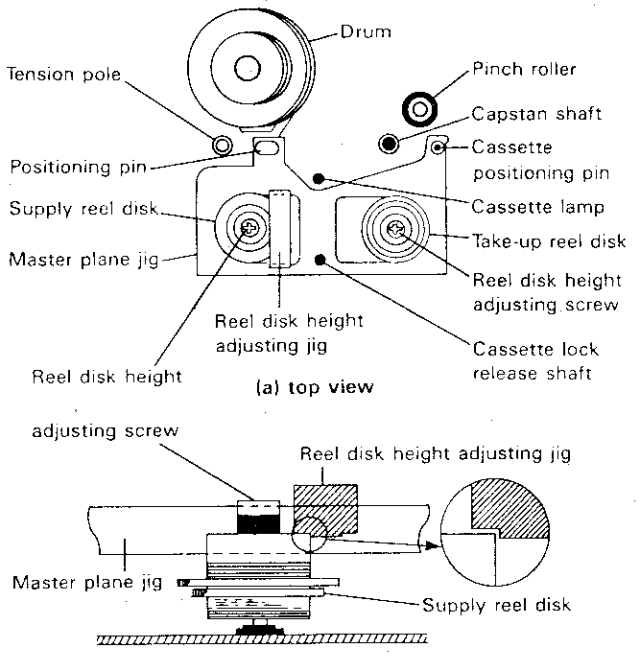


Figure 1-9.

CHECKING AND ADJUSTMENT OF TAKE-UP TORQUE IN FAST-FORWARD MODE

Notes:

1. When setting the torque gauge on the take-up reel disk and pushing the fast-forward button to start the reel disk turning, take care that the torque gauge does not fly off.
2. The checking and adjustment should be carried out without a video cassette tape in place.

- **Checking**

1. Remove the cassette housing assembly.
2. Place the torque gauge on the take-up reel disk and push the fast-forward button to place the unit in the fast-forward mode.
3. Turn the torque gauge slowly (one rotaion every 2 to 3 seconds) by hand in the take-up direction and check that it indicates 700 g.cm or more.

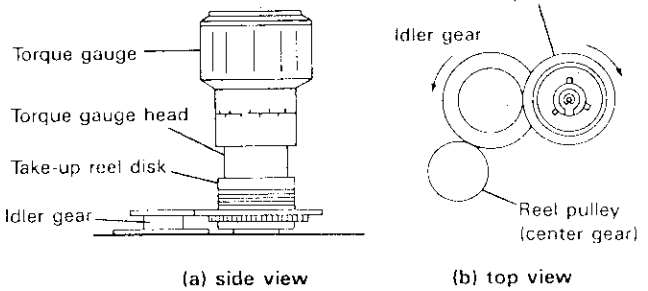


Figure 1-10.

- **Adjustment**

If the take-up torque is outside the specified range, clean the capstan D.D. motor pulley, reel belt and reel pulley with cleaning liquid, then recheck the torque.
If the take-up torque is still out of specification, replace the reel belt.

CHECKING AND ADJUSTMENT OF TAKE-UP TORQUE IN REWIND MODE

Notes:

1. When setting the torque gauge on the supply reel disk and pushing the rewind button to start the reel disk turning, take care that the torque gauge does not fly off.
2. When checking the take-up torque, do not keep the reel disk locked for a longer time.

- **Checking**

1. Remove the cassette housing assembly.
2. Place the torque gauge on the supply reel disk and push the rewind button to place the unit in the rewind mode.
3. Turn the torque gauge slowly (one rotation every 2 to 3 seconds) by hand in the take-up direction and check that in indicates 700 g.cm or more.

- **Adjustment**

If the take-up torque is outside the specified range clean the capstan DD motor pulley, reel belt and reel pulley with cleaning liquid, then recheck the torque.
If the take-up torque is still out of specification, replace the reel belt.

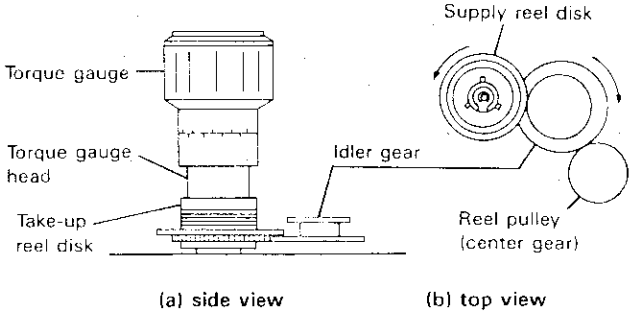


Figure 1-11.

CHECKING OF TAKE-UP TORQUE IN PLAY-BACK MODE

- **Checking**

Load a cassette torque meter (JiGVHT-063) into the unit and push the record button to place the unit in the record mode. Then check that the torque is as specified;

torque: 95 ± 30 g.cm

Note:

The measured torque fluctuates due to the rotational deviation of the reel drive unit. Use the center of the fluctuating range as the measured value.

1. If the take-up torque in playback mode is outside the specified value, replace the take-up reel disk.
2. Push the record button to place the unit in the record mode, and check that the take-up torque is within the specified range.

CHECKING OF TAKE-UP TORQUE IN VIDEO SEARCH REWIND MODE

- **Checking**

Load a cassette torque meter (JIGVHT-063) into the unit and push the play and video search rewind buttons to place unit in the video search rewind mode.

Then check that the torque is as specified;

torque in video search rewind mode : 170 ± 40 g.cm

Note:

The measured torque fluctuates due to the rotational deviation of the supply reel disk. Use the center of the fluctuating range as the measured value.

1. If the take-up torque in video search rewind mode is outside the specified range, replace the supply reel disk.

CHECKING THE FAST FORWARD BACK TENSION

Note:

Set the torque gauge securely on the supply reel disk; if the torque gauge is loose above the reel disk, an inaccurate measurement will result.

- **Checking**

1. Remove the cassette housing assembly.
2. Push the fast forward button to place the unit in the fast forward mode.
3. Place the torque gauge on the supply reel disk, and turn it clockwise very slowly (one rotation every 2 to 3 seconds) and check that the torque is within 15 ± 5 g.cm.

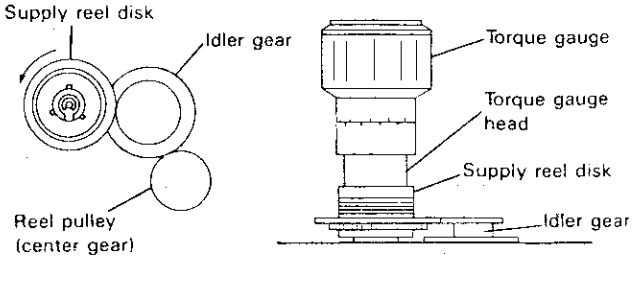


Figure 1-12.

CHECKING THE REWIND BACK TENSION

Note:

Set the torque gauge securely on the take-up reel disk; if the torque gauge is loose above the reel disk, an inaccurate measurement will result.

- **Checking**

1. Remove the cassette housing assembly.
2. Push the rewind button to place the unit in the rewind mode.
3. Place the torque gauge on the take-up reel disk, and turn it counterclockwise very slowly (one rotation every 2 to 3 seconds) and check that the torque is within 15 ± 5 g.cm.

CHECKING THE VIDEO SEARCH REWIND BACK TENSION

Note:

Set the torque gauge securely on the take-up reel disk; if the torque gauge is loose above the reel disk, an inaccurate measurement will result.

- **Checking**

1. Remove the cassette housing assembly.
2. Push the play button to place the unit in the playback mode.
3. Push the video search rewind button to place the unit in the video search rewind mode.
4. Place the torque gauge on the take-up reel disk, and turn it counterclockwise very slowly (one rotation every 2 to 3 seconds) and check that the torque is within 40 ± 10 g.cm.

CHECKING THE PINCH ROLLER PRESSURE

1. Remove the cassette housing assembly.
2. Push the play button to place the unit in the playback mode.
3. Hook the tension gauge adapter around the pinch roller shaft.
4. Using a tension gauge, pull the pinch roller in the direction of arrow ➡ Ⓐ so that the pinch roller moves away from the capstan shaft.
5. Gradually release the pressure in the direction of arrow➡ Ⓑ to allow the pinch roller to touch the capstan shaft. When the pinch roller just touches the capstan shaft, read the indication on the gauge.
6. Check that the reading of the tension gauge is in the range of 1000 to 1200 gr.

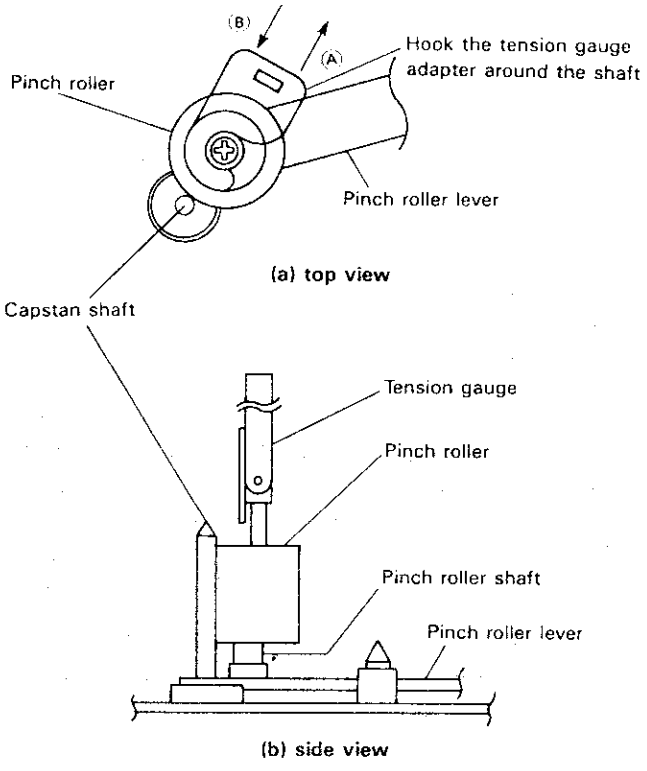


Figure 1-13.

ADJUSTMENT OF TENSION POLE

- **Position checking (Fig. 1-14)**

1. Remove the cassette housing assembly.
2. Set a video cassette tape and push the record button to place the unit in the record mode.
3. The pole bases (see page 4; item 19 and 27.) operate to bring the tape outside the cassette housing and simultaneously the tension pole moves to the left, loading the tape. At that time (loading mode), check the position of the tension pole.

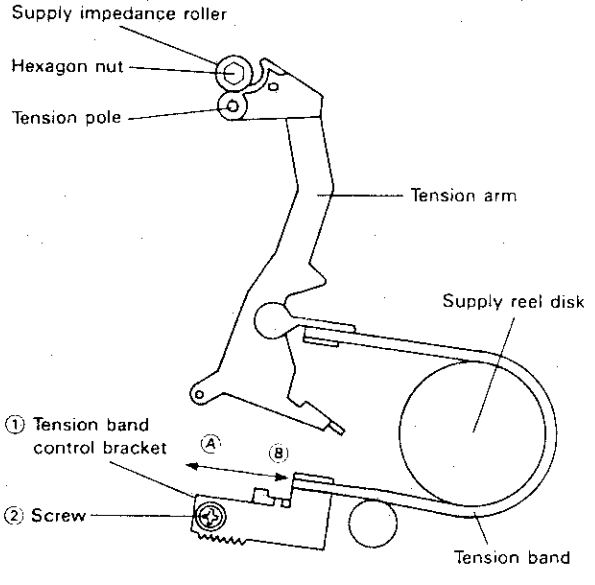


Figure 1-14.

4. At the end of the tape (E-180), check that the tension pole's center is aligned with the supply impedance roller's center.
5. Check that the tape is neither curled against the flange of the supply impedance roller nor mounted over it.
6. During the video search rewind mode with no cassette tape in place, check the supply reel disk is free of the tension band.

- **Position adjustment (Fig. 1-15)**

1. If the tension pole is at the right of the supply impedance roller's center, shift the tension band control bracket ① in the direction of arrow ➡ Ⓑ , and tighten the screw ②.
2. If the tension pole is at the left of the supply impedance roller's center, shift the tension band control bracket ① in the direction of arrow ➡ Ⓐ , and tighten the screw ② .

ADJUSTMENT OF RECORD/PLAYBACK BACK TENSION

- **Checking**

1. Remove the cassette housing assembly.
2. Put a torque cassette meter into the unit.
3. Push the record button to place the unit in the record mode. Check that the reading of the cassette meter is 23 to 28 g.cm.
4. Make sure the video cassette tape is wound over the retaining guide.
5. Make sure that the tape is not slack nor damaged at both ends.

- **Adjustment (Fig. 1-15)**

1. If the back tension is lower than specified, move the tension spring hook plate ① in the direction of arrow ➡ Ⓐ so that the protuberance behind be tight in the hole.
2. If the back tension is higher than specified, move the tension spring hook plate ① in the direction of arrow ➡ Ⓑ so that the protuberance behind be tight in the hole.

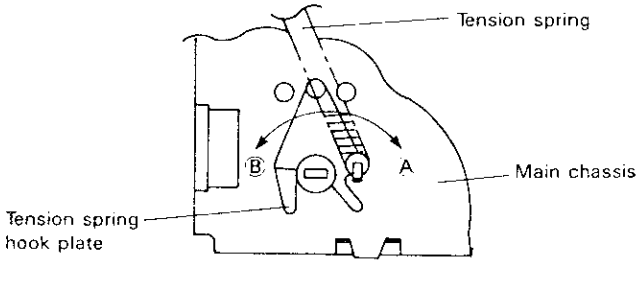


Figure 1-15.

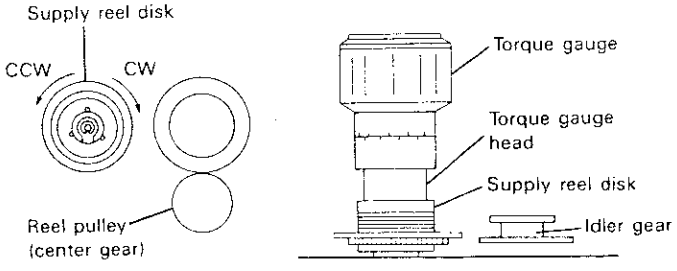
Figure 1-16. Not used.

CHECKING THE BRAKE TORQUE

A) Checking the brake torque at the supply side.

- **Checking**

1. Remove the cassette housing assembly.
2. Check that the mechanism is in the stop mode.
   Note: The stop mode is brought about by unplugging the power cord with the mechanism in the fast forward or rewind mode.
3. Separate the idler gear from the supply reel disk and place the torque gauge on the supply reel disk.
4. Slowly rotate the torque gauge in the clockwise (CW) direction of the supply brake so that the reel disk and the gauge needle rotate at the same speed. Do the same in the counterclockwise (CCW) direction of the supply brake. Check that the values are within the specified range (CW direction = 280 to 720 g.cm, CCW direction = 110 to 230 g.cm) and that the brake torque in the CW direction is at least twice as high as that in the CCW direction.



(a) top view (b) side view

Figure 1-17.

- **Adjustment**

1. If the supply brake torque is outside the specified range (CW direction = 280 to 720 g.cm, CCW direction = 110 to 230 g.cm), clean the supply reel disk and brake lever felt, then recheck the torque.
2. If the supply brake torque is still outside the specified range, replace the main brake spring.

B) Checking the brake torque at the take-up side.

- **Checking**

1. Remove the cassette housing assembly.
2. Check that the mechanism is in the stop mode.
   Note: The stop mode is brought about by unplugging the power cord with the mechanism in the fast forward to rewind mode.
3. Separate the idler gear from the take-up reel disk and place the torque gauge on the take-up reel disk.

4. Slowly rotate the torque gauge in the CCW direction of the take-up brake so that the reel disk and the gauge needle rotate at the same speed. Do the same in the CW direction of the take-up brake. Check that the values are within the specified range (CCW direction = 280 to 720g.cm, CW direciton = 90 to 200 g.cm) and that the brake torque in the CCW direction is at least twice as high as that in the CW direction.

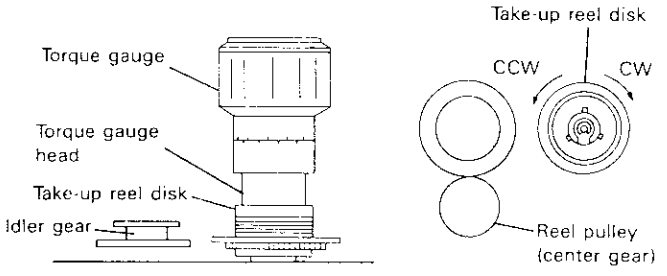


Figure 1-18.

- **Adjustment**

1. If the take-up brake torque is outside the specified range (CCW direction = 280 to 720g.cm, CW direction = 90 to 200 g.cm), clean the take-up reel disk and brake lever felt, then recheck the torque.
2. If the take-up brake torque is still outside the specified range, replace the main brake spring.

REPLACEMENT OF A/C (Audio/Control) HEAD

Note:

After replacement, perform the adjustment of tape drive train. Under any circumstances avoid touching the head (indicated by"⇒" in Fig. 1-20(c)).

•Replacement (See Figs. 1-19 and 1-20.)

1. Loosen the tilt adjusting screw ⑥ by using Phillips screwdriver.
2. Remove the azimuth adjusting screw ⑤ with a Phillips screwdriver.
3. Remove the A/C head screw ④ with a Phillips screwdriver, paying attention to the spring ⑦ between the A/C head screw ④ and A/C head pedestal.

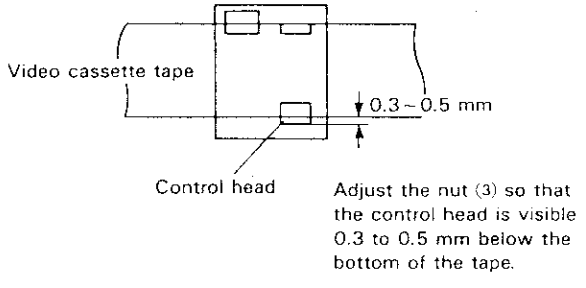

Video cassette tape
0.3~0.5 mm
Control head
Adjust the nut (3) so that the control head is visible 0.3 to 0.5 mm below the bottom of the tape.

Figure 1-19.

4. Remove the A/C head PWB ⑧ soldered to the A/C head assembly, and solder the A/C head PWB ⑧ onto a new A/C head assembly.
5. The A/C head assembly ① is attached so that the A/C head arm ② and A/C head pedestal are roughly parallel to each other.

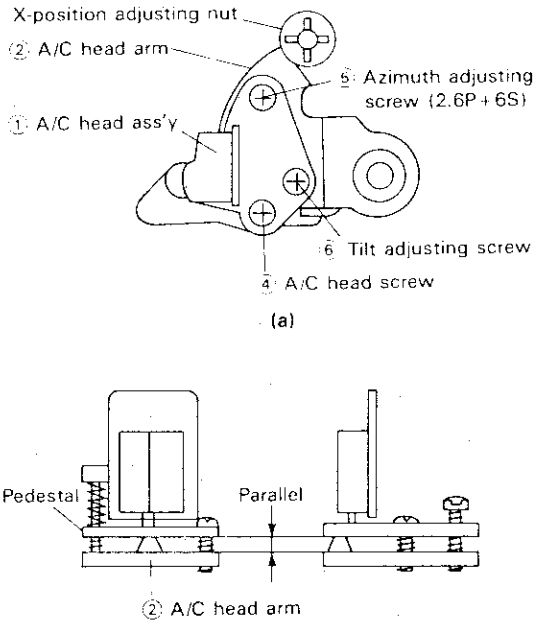


Figure 1-20.

6. Set the A/C head tilt angle according to Fig. 1-22.
7. Play an alignment tape and roughly adjust the height of the A/C head, visually, by turning the A/C head adjusting hexagon nut ③ with the box driver (JiGDRiVER110-7) until the tape comes to the position shown below. (See Fig. 1-19.)
8. Set the mechanism to the loading mode. Place the A/C head tilt adjusting jig on the main chassis as shown in Fig. 1-21. Slowly turn the tilt abjusting screw ⑥ with a Phillips screwdriver until there is no gap between the jig and the A/C head.

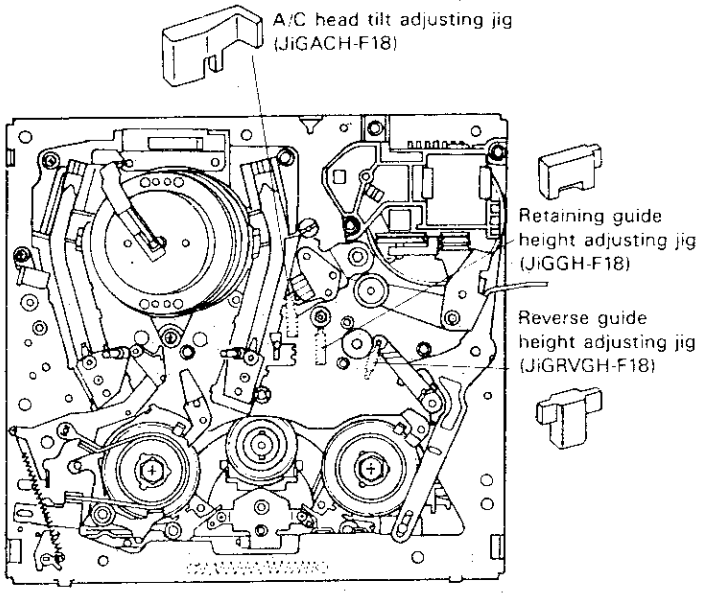


Figure 1-21.

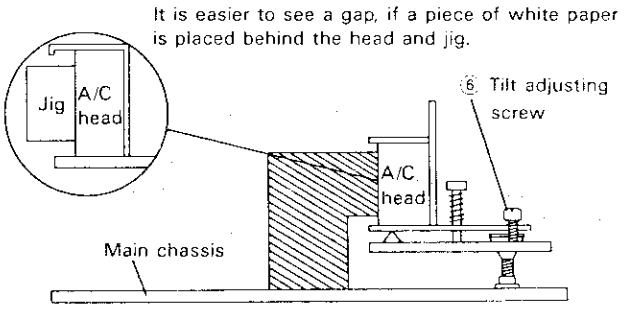

Be sure there is no gap.
It is easier to see a gap, if a piece of white paper is placed behind the head and jig.
Jig
A/C head
⑥ Tilt adjusting screw
A/C head
Main chassis

Figure 1-22.

HEIGHT ADJUSTMENT OF RETAINING GUIDE AND REVERSE GUIDE

- **Adjustment**

1. Before the rough adjustment of tape drive train, check that the retaining guide and reverse guide heights are within the specified values of Fig. 1-23, by using the special jigs.
2. If the retaining guide height is not correct,adjust the height with the box driver (JiGDRiVER110-4).
3. If the reverse guide height is not correct, use the height adjusting washers.

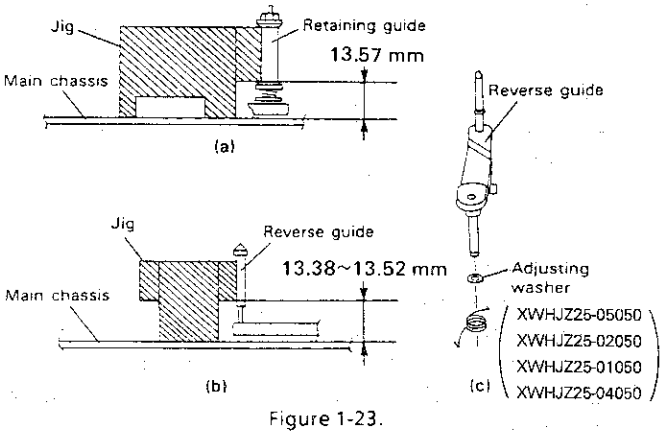


Figure 1-23.

ADJUSTMENT OF TAPE DRIVE TRAIN

1. Check and adjust the position of the tension pole and the back tension.(See pages 15)
2. Set the tilt angle of the A/C head as shown in Fig. 1-22.
   Note:
   If the A/C head is adjusted, check and set the tilt angle as in the case of replacement.
3. When the above adjustments have been completed, roughly adjust the tape drive train using an alignment tape.
   a. Connect the oscilloscope to the test points for PB chroma output (TP501) and head switching pulse (TP502). Allow the PB CHROMA signal to be triggered by the head switching pulse of TP502.
   b. Loosen the setscrew of the guide roller, and tighten it loosely by using the special bladed screwdriver (JiGDRiVERH-4) to such an extent that the guide roller turns smoothly.
   c. Set the alignment tape (VROCPSV) on the reel disk.
   Note:
   Attach a 400 to 500g.weight to the cassette tape when a cassette tape is placed on the reel disk with the cassette housing assembly removed.

d. Place the unit to the playback mode.
e. Observe the waveform of the PB chroma, and push the (+)or(-) tracking button to check for a flat PB chroma. This adjustment is satisfactory if a flat response is obtained on the waveform of the PB chroma when the (+)or(-) tracking button is pushed. If a flat response cannot be obtained roughly adjust the guide roller using the special bladed screwdriver until the PB chroma output is flat.
While keeping the both(+)and(-) tracking buttons down, adjust the X-position adjusting nut so that the PB CHROMA envelope becomes almost maximum. In the case of rough adjustment, pay particular attention to the outlet side (see Fig. 1-24).
f. Adjust the retaining guide height so that the lower flange of the retaining guide touches the bottom edge of the tape. At that time, check that the tape is not curled nor wrinkled.

4. The A/C head height and azimuth are adjusted after rough adjustment of the tape drive train has been done.
a. Use the alignment tape and play back its audio 7kHz signal (monoscope pattern for video signal)and observe the audio output on an oscilloscope.
b. Adjust the azimuth adjusting screw so as to obtain the maximum audio output.
c. Use the alignment tape and play back its audio 1kHz signal (colour bar for video signal) and slowly rotate the A/C head height adjusting nut with the special box driver so as to obtain the maximum audio output.
d. After the height adjustment, use the alignment tape and play back its audio 7kHz signal (monoscope pattern for video signal) again and adjust the azimuth adjusting screw so as to obtain the maximun audio output.
After this adjustment, apply glyptal to the screws and nuts to fix them.

5. The final adjustments of tape drive train and X-position are adjusted after adjustment of the A/C head has been completed.
a. Connect the oscilloscope to the test points for PB chroma output (TP501) and head switching pulse (TP502). Allow the PB CHROMA signal to be triggered by the head switching pulse of TP502.
b. Play back the tape drive train alignment tape (VROCPSV).
c. Finely adjust the guide rolle's height, observing the envelope on the oscilloscope.
Push the (+) or (-) tracking button while adjusting the guide roller, in order to obtain an envelope waveform which is as flat as possible. If the tape is above or below the helical lead, the PB chroma waveform will take the shape shown in Fig. 1-26.
Adjust for maximum flatness of the envelope according to the figure.
Note:
Adjustment is made for CH-1 of switching pulse (low level). The broken lines indicate the envelope waveform when the tape does not run properly.
Push the (+) or (-) tracking button to check the envelope waveform.
After adjustment, tighten the setscrew of the guide roller firmly.
Play back the alignment tape (VROCPSV) again in the unloading mode, and make sure that there is on change in the PB chroma output.

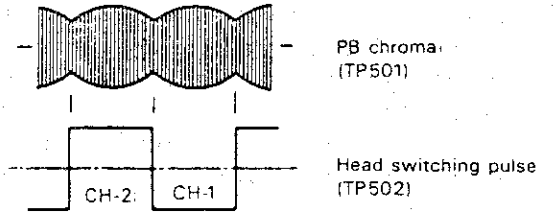


Figure 1-24.

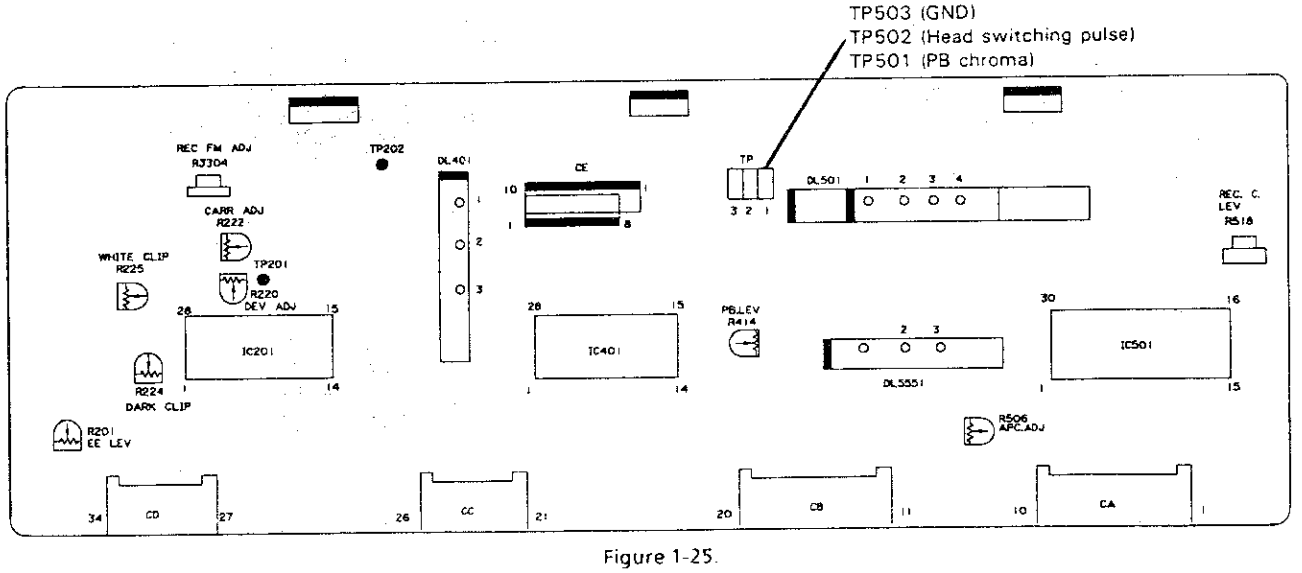


Figure 1-25.

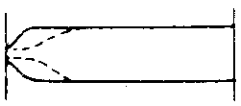
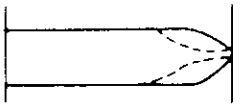
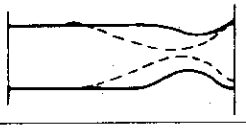
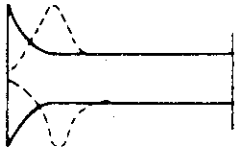
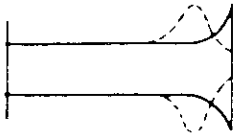
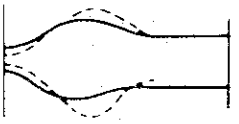
	When the tape is above the helical lead.		When the tape is below the helical lead.	
	Supply side	Take-up side	Supply side	Take-up side
				
				
Adjustment	Supply side guide roller rotated in clockwise direction (lowers guide roller) to flatten envelope.	Take-up side guide roller rotated in clockwise direction (lowers guide roller) to flatten envelope.	Supply side guide roller rotated in counterclockwise direction (raises guide roller) to have the tape float above the helical lead. The supply side guide roller is then rotated in the clockwise direction to flatten the envelope.	Take-up side guide roller rotated in counterclockwise direction (raises guide roller) to have the tape float above the helical lead. The take-up side guide roller is then rotated in the clockwise direction to flatten the envelope.

Figure 1-26.

d. Adjust the etaining guide height so that the lower flange of the retaining guide touches the bottom edge of the tape. At that time, check that the tape is not curled nor wrinkled.
e. The X-position is adjusted after tape drive train adjustment.
Push the (+) and (-) tracking buttons at the same time to set the tracking buttons to the preset mode, and rotate the X-position adjusting nut shown in Fig. 1-27 with the special bladed screwdriver for maximum switching pulse low side envelope, and then adjust the A/C head position. Now adjust the play back switching point to 6.5 ±0.5H.
Check the flatness of envelope and sound by selfrecording.

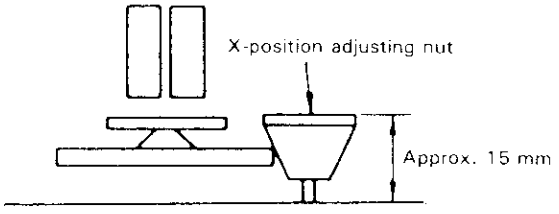


Figure 1-27.

REPLACEMENT OF UPPER DRUM

Note:
The engagement between the lower drum (outer diameter) and the upper drum(inner diameter) is very accurate, in the order of microns, and care should be paid to their replacement. Even a slight entry of foreign material will affect the accuracy of their reassembly.

- **Replacement (See Fig. 1-28)**

1. Unsolder the leads (1) to (8) from the video head and remove them.
2. Remove the two screws (9) (brass screws with washers) using a Phillips screwdriver.

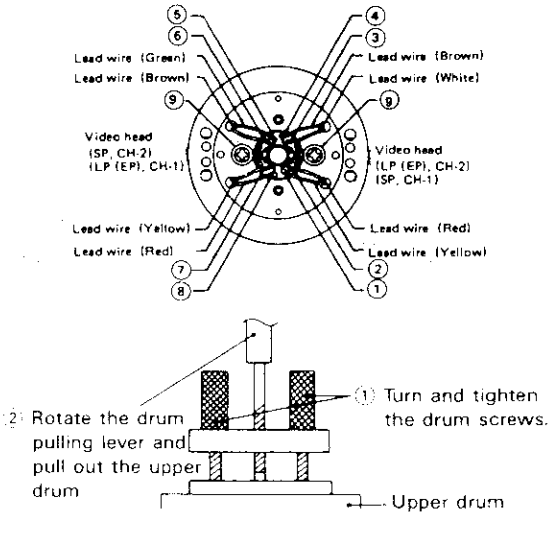

Lead wire (Green)
Lead wire (Brown)
Lead wire (Brown)
Lead wire (White)
Video head (SP, CH-2) (LP (EP), CH-1)
Video head (LP (EP), CH-2) (SP, CH-1)
Lead wire (Yellow)
Lead wire (Red)
Lead wire (Red)
Lead wire (Yellow)
(2) Rotate the drum pulling lever and pull out the upper drum
(1) Turn and tighten the drum screws.
Upper drum

Figure 1-28.

3. Withdraw the upper drum by pulling it up with the upper drum replacement jig.

Notes:
1. Avoid touching the drum surface with bare hands.
2. Do not hit the screws when tightening them.

- **Reassembly**

1. Set a new drum for replacement, as shown in Fig. 1-28, and position the leads properly.

Notes:
1. Before replacing the upper drum, check that there are no scratches or dust on the edge or the outer surface of the lower drum.
2. Before replacing the upper drum, check that there are no scratches or dust on the edge or the inner surface of the upper drum.
3. On assembling these parts, slowly insert the upper drum onto the lower drum with the upmost care, so that the upper drum is not tilted.
4. When assembling these parts, do not allow foreign material to come between them.
5. Do not use excessive force when driving in the screws.

2. Fasten the upper drum in place with the two screws ⑨ .
3. Solder the leads ① to ⑧ at their respective pads.
   Note:
   Soldering should be performed quickly and carefully without touching adjacent patterns.
4. After replacement, be sure to check the tape drive train adjustment and the following.
   - Adjustment of the playback switching point (See page 26).
   - Checking and adjustment of the X-position (See page 27).
   - Adjustment of SP slow tracking preset (See page 26).

REPLACEMENT OF D.D. (DIRECT DRIVE) MOTOR

Note:
Put the unit in the cassette eject position.

- **Removal**

1. Remove the six screws from the bottom panel and remove the bottom panel.
2. Disconnect the drum D.D. motor lead connector.
3. Remove the two screws① which hold the D.D. rotor assembly in place, using a Phillips screwdriver.
4. Remove the D.D. rotor assembly.
5. Remove the three screws ② which hold the D.D. stator assembly in place, using a Phillips screwdriver.
6. Remove the D.D. stator assembly.

- **Reassembly**

1. Place the D.D. stator assembly on top of the lower drum.
2. Secure the D.D. stator with the three screws ② using a Phillips screwdriver.

   Note:
   Be careful not to scratch the core, windings or Hall device.
3. Install the D.D. rotor assembly onto the drum shaft.

   Note:
   Install the assembly directly onto the direction of the shaft. (Refer to Fig. 1-29 for the installation direction.)
4. Secure the D.D. rotor assembly with the screws ①.
5. Connect the drum D.D. motor lead connector.
6. Install the bottom panel with six screws.

   Note:
   Be careful not to damage the upper drum or the video head.
7. After replacement of the D.D. motor as shown above, proceed with the adjustment of the playback switching point.

Notes:
1. Be careful not to damage the upper drum or the video head.
2. Be sure that the Hall device and the D.D. stator assembly are not damaged by the D.D. rotor assembly or other parts.

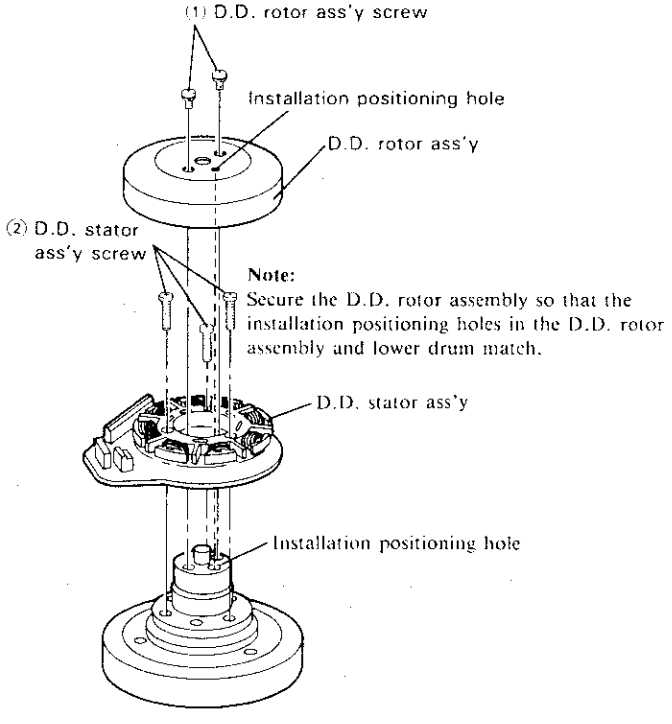

(1) D.D. rotor ass'y screw
Installation positioning hole
D.D. rotor ass'y
(2) D.D. stator ass'y screw
Note:
Secure the D.D. rotor assembly so that the installation positioning holes in the D.D. rotor assembly and lower drum match.
D.D. stator ass'y
Installation positioning hole

Figure 1-29.

REPLACEMENT OF THE CAPSTAN D.D. (DIRECT DRIVE) MOTOR

- **Removal**

1. Remove the FFC ① from the capstan D.D. motor control PWB ②.
2. Remove the three screws ③, and remove the capstan D.D. motor ④ from the main chassis.

- **Reassembly**

1. Mount the capstan motor on the main chassis while making sure not to allow the capstan shaft to hit the main chassis, and attach it with the three screws ③.
2. Insert the FFC ① into the capstan D.D. motor control PWB ②.

Notes:

1. After installing the capstan D.D. motor, be sure to rotate the capstan motor and check the movement.
2. Check and adjust the servo circuit.

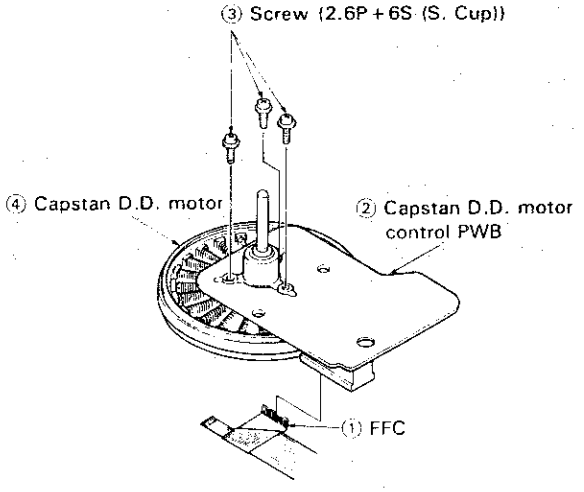


Figure 1-30.

REMOVAL AND REASSEMBLY OF THE LOADING GEAR BLOCK

- **Removal**

1. Remove the slow brake spring ① and slow brake lever ②.
2. Take out the E ring Ⓐ first and then the loading relay gear ③.
3. Rotate the take-up loading gear ④, take-up loading arm assembly ⑤, supply loading gear ⑥ and supply loading arm assembly ⑦ slightly in the loading direction, and take them all out.
4. Finally remove the E ring Ⓑ and relay gear drive lever ⑧.

- **Reassembly**

1. Take the reverse steps of the removal.
2. In reassembling, match the tally marks on the gears, as shown in Fig. 1-31

Note:

1. When reassembling, apply grease to the following points; all the gear teeth, all the gear shafts, and the cam groove of loading relay gear which the relay gear drive lever pin comes in.
2. Be careful not to deform the supply/take-up loading arms.
3. Be careful not to stain the felt of the slow brake.
4. Be also careful to keep the outer surface of the capstan D.D. motor ⑨ free from dust and dirt. (If stained, the MR (Magnet Resistor) element ⑩ might be damaged.)
5. Reshape the anti-fall hooks of the slow brake, supply/take-up loading gears as required. Avoid reshaping too much.

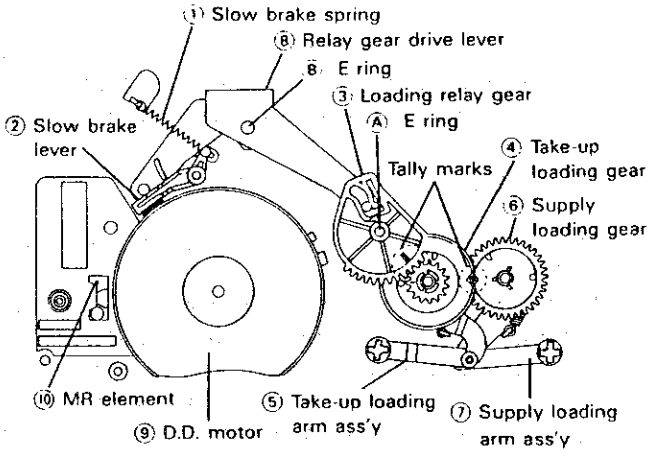


Figure 1-31.

REMOVAL AND REASSEMBLY OF LOADING BLOCK

- **Removal**

1. Remove the leads and the cassette loading belt from the loading block.
2. Unscrew the three screws ③, and pull up and remove the loading block.

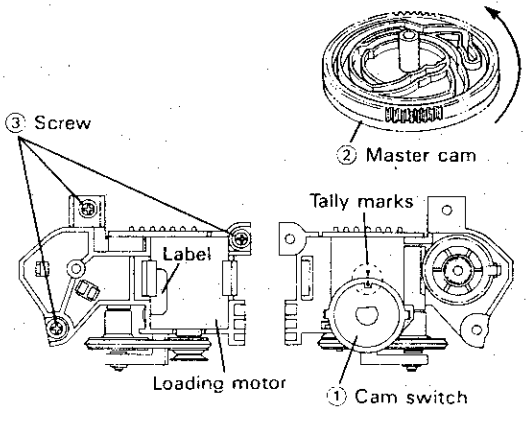


Figure 1-32.

- **Reassembly**

1. Turn the master cam ② all the way counter-clockwise.
2. Match the tally mark on the cam switch ① with the mating mark. Fit the loading block and the master cam with each other. Tighten up the three screws.
3. Finally connect the leads and apply the cassette loading belt.

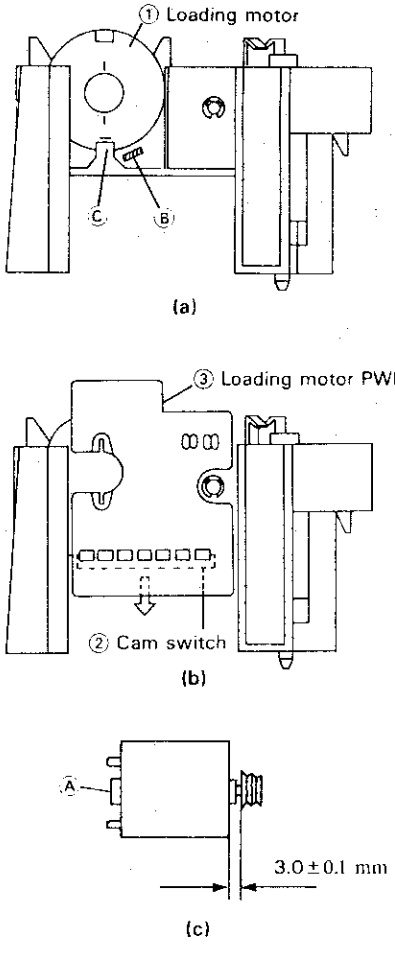
Notes:

1. Be careful not to scratch the gear.
2. Be careful not to stain the belt. If dirty, clean it up.

REPLACEMENT OF LOADING MOTOR

- **Removal**

1. Remove the loading block.
2. Undo the loading belt.
3. Unsolder the leads from the loading motor ①.
4. Unlock the left and right catches of the cam switch ② off the loading block. Take out the loading block PWB ③.



Note:

1. Press-fit the loading motor pulley to the dimension specified in Fig. 1-33(c).
2. Keep the pressure on the part Ⓐ (see above) less than 5 kg.

Figure 1-33.

5. Put the tip of a bladed screwdriver or the like into the opening Ⓑ shown in Fig. 1-33 (a). Pry up the back end of the loading motor ① and take out the motor.

- **Reassembly**

1. Place the loading motor so that its label is visible as ahown in Fig. 1-32.
   Note:
   Make sure that the screw hole at the motor shaft and the protuberance on the loading block are properly engaged and that the notch at the loading motor end and the part Ⓒ of the loading block are also fitted together.
2. Set up the loading block PWB ③ and the cam switch ② in position.
3. Resolder the leads to the loading motor.
4. Finally place the loading block in position.

REPLACEMENT OF MASTER CAM

- **Removal**

1. Remove the loading block.
2. Remove the E ring Ⓐ and then the half-loading reciprocating lever ①.
   Note:
   There is no need to take out the half-loading drive lever.
3. Remove the E ring Ⓑ first and then the pinch roller lever ②.
4. Finally pull out the master cam ③ upward.

- **Reassembly**

1. Place the relay gear drive lever in the unloading state as shown in Fig. 1-31.
2. Set the relay shifter lever ④ to the main chassis; the shifter lever should be adjusted to the reverse guide spring hole in the main chassis. Then place the master cam so that the cut-off part of the boss Ⓒ should face the direction of arrow ⇒ Ⓔ.
3. Place the half-loading reciprocating lever ① so that its cam follower comes in the outermost cam groove. Now attach the E ring Ⓐ.
   Note:
   Preferably hook the half-loading reciprocating spring ⑤ before attaching the lever. It is easier to set up.
4. Turn the master cam ③ somewhat clockwise until the pinch roller lever's cam follower comes into the master cam's groove Ⓓ. Then attach the E ring Ⓑ.
5. Rotate the master cam ③ by hand to make sure all the four levers (relay gear drive lever, relay shifter lever, half-loading reciprocating lever and pinch roller lever) are right in the cam grooves.
6. Finally set up the loading block.

Notes:

1. Be careful not to scratch the teeth and grooves of the master cam.
2. Before placing the loading block, be sure to rotate the master cam by hand to make sure the levers are right in their respective positions. Otherwise the master cam and the levers might get damaged when the motor starts.
3. Apply grease to the master cam's grooves and teeth.

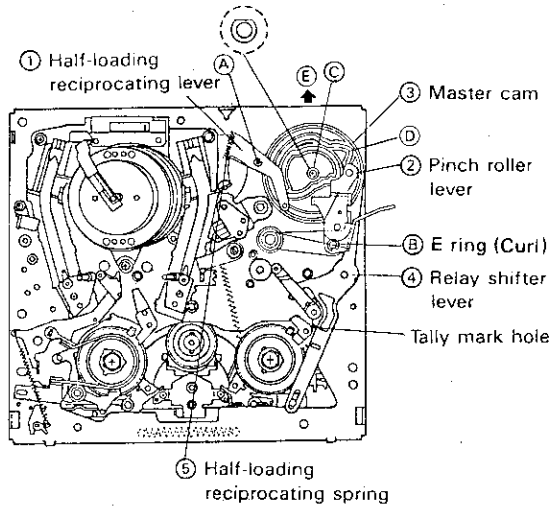


Figure 1-34.

HOW TO UNLOAD THE CASSETTE MANUALLY

1. To unload the cassette the common way.

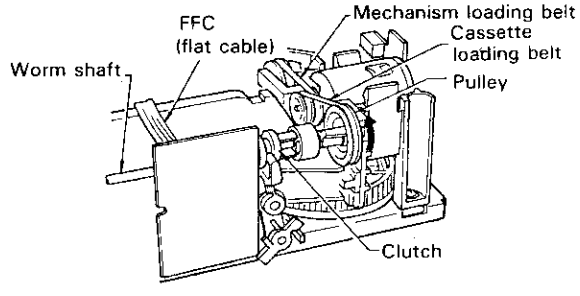


Figure 1-35.

(1) Turn the pulley in the direction of arrow. (By this, the clutch becomes engaged to eject the cassette.)

Notes:

- Do not touch the worm shaft. Just turn the pulley, and the worm shaft will rotate together.
- Carefully turn the pulley if the unit is equipped with the half-loading lever. Otherwise the cassette tape may get loose.

(2) To unload the cassette by activating the cassette housing control.

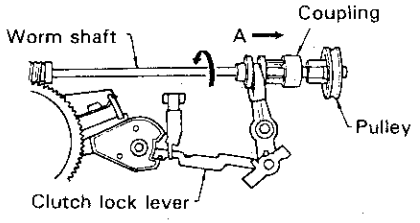


Figure 1-36.

(1) Remove the cassette loading belt.
(2) Turn the coupling in the direction of arrow until tl cassette comes up.
(3) Press the clutch in the direction A to get the clut engaged.
(4) Now turn the worm shaft all the way in the dire tion of arrow to take out the cassette.

Notes:

- Carefully turn the worm shaft if the unit equipped with the half-loading lever. Otherwise the cassette tape may become loos
- If the second method (activating the casset housing control) is carried out, the cassette hou ing control and the mechanism come out of pha from each other. Take the following steps to g in phase with the cassette housing control.

(1) Remove the cassette loading belt and the fl cable.
(2) Turn the power on. The mechanism will autom ically be in the eject mode and get in phase wi the cassette housing control.
(3) Unplug the power cord.
(4) Make sure the cassette housing stays in the eje mode. Apply the cassette loading belt and conne the flat cable.
(5) Plug in the power cord. Finally load the casset and eject it to make sure the motion is perfec (This loading and ejection makes for prop phasing.)

- If the tape has not been fully rewound, remove tl bottom panel of the unit and turn the capstan D. motor rotor or the reel pulley in the direction of a row B to wind up the tape. Now you can take out the cassette witho damaging the tape.
- Before taking the above measure, be sure to u plug the power cord.

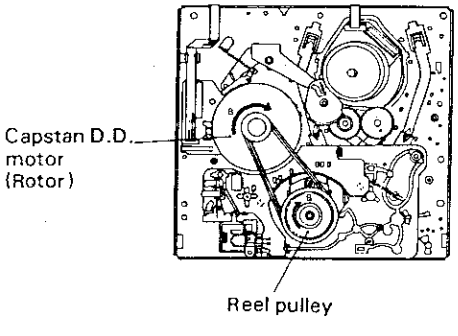


Figure 1-37.

ADJUSTMENT OF ELECTRICAL CIRCUITRY

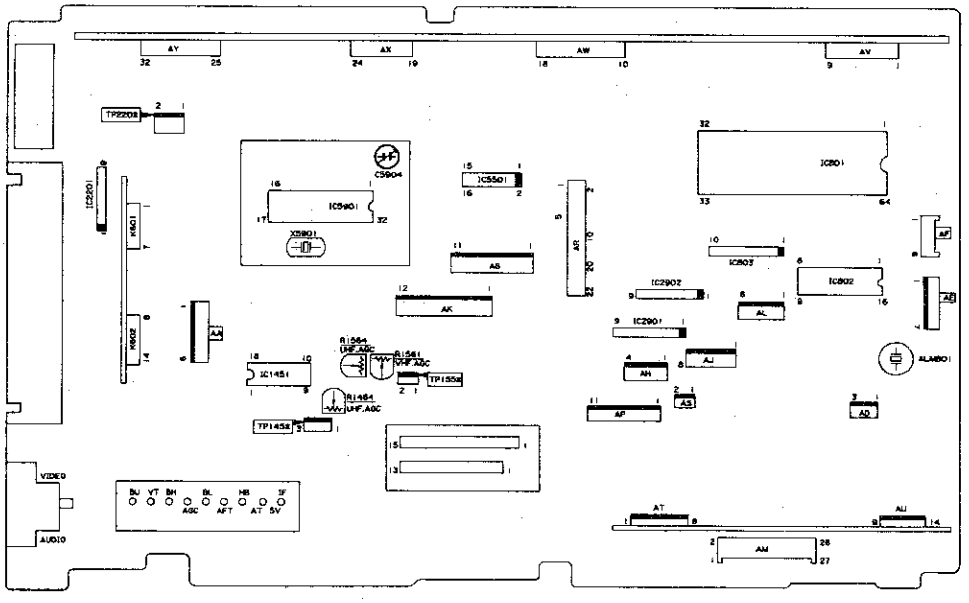
Prior to the adjustment:
In most cases, necessity for electrical circuits will arise from replacement of mechanical parts including the video head. Before starting adjustment of electrical circuits, check that mechanical operation of the equipment is complete (the mechanism are adjusted completely).

If the equipment fails electrically, locate a defect or defects first of all using instruments. Then repair or replace parts and make adjustment by the procedures described below.
When required instrumetns are not available, do not move controls indiscriminately.

- **Instruments**
  - Colour monitor TV
  - Oscilloscope
  - Colour bar generator
  - Frequency counter
  - DC regulated power supply
  - Audio generator
  - Alignment tape
  - Blank video tape(VHS)
  - VTVM
  - Voltmeter

ADJUSTMENT OF MAIN (SYSTEM CONTROL, TUNER) CIRCUIT AND SERVO CIRCUIT

- **Test points layout**



MAIN PWB

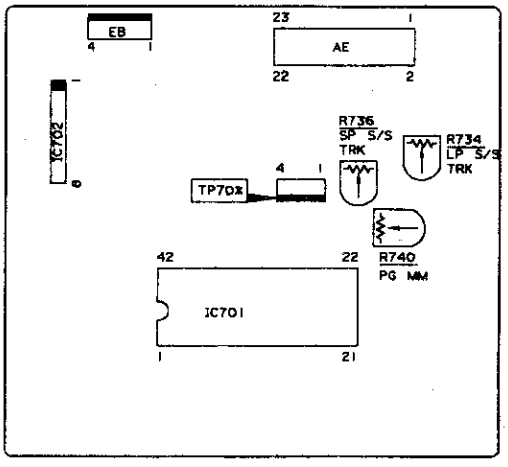


Figure 2-1. SERVO PWB

ADJUSTMENT OF SERVO CIRCUIT

Adjustment of playback switching point

Measuring instrument	Oscilloscope
Mode	Playback Tracking button at center
Tape used	Alignment tape (VROCPSV)
Test point	CH-1; TP701 CH-2; Video output terminal (CH-1 trigger slope switch at(+), Internal trigger at CH-1 side)
Adjusting point	R740(phase generator MM control)
Specification	6.5 ± 0.5H

1. Insert the alignment tape (VROCPSV) and put the unit in the playback mode.
2. Set the tracking button to the center position.
3. Adjust R740 (phase generator MM control) so that the waveform on the oscilloscope screen be as shown in Fig. 2-2.

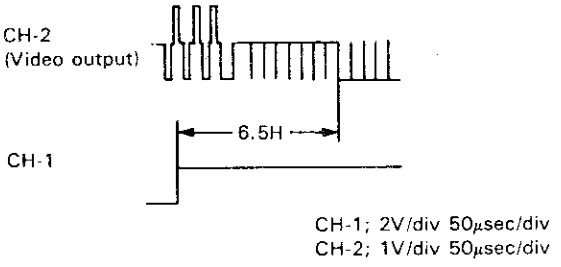


Fig. 2-2.

Adjustment of SP slow tracking

Measuring instrument	Monitor TV
Mode	Record time switch at sp Position. Recording and playback on self-recording tape.
Input signal	Commercial broadcast or video signal (external input selector switch)
Test Point	Monitor screen
Adjusting point	R736 (SP slow tracking control)
Specification	No noise bar on the monitor TV screen

1. Receive a commercial broadcast signal, or feed the video signal to the video input terminal (with the external input selector switch).
2. Set the record time switch to the SP position. Make recording and playback on the self-recording tape.
3. Press the slow button and play back the recorded portion in the slow mode.
4. Set the SP slow tracking control to the center click position.
5. Observing the monitor screen, adjust the SP slow tracking preset control (R736) until the noise bar disappears from the screen.
6. Press the playback button to play back the tape. Then push the pause/still button to reproduce the recording in the still mode. Now make sure there is no noise on the screen. (Repeat this step three times or so.)

Adjustment of LP slow tracking priset

Measuring instrument	Monitor TV
Mode	Record time switch at LP position. Recording and playback on self-recording tape.
Input signal	Commercial broadcast or video signal (external input selector switch)
Test point	Monitor screen
Adjusting point	R734 (LP slow tracking control)
Specification	No noise bar on the monitor TV screen

1. Receive a commercial broadcast signal, or feed the video signal to the video input termminal (with the external input selector switch).
2. Set the record time switch to the LP position. Make recording and playback on the self-recording tape.
3. Press the slow button and play back the recorded portion in the slow mode.
4. Observing the monitor screen, adjust the LP slow trackting preset control(R734) until the noise bar disappears from the screen.
5. Press the playback button to play back the tape. Then push the pause/still button to reproduce the recording in the still mode. Make sure thre is no noise on the screen

(Repepeat this step three time or so.)

Precaution in adjusting the X position

Measuring instrument	Oscilloscope
Mode	Playback
Tape used	Alignment tape(VROCPSV)
Test point	TP702 (tracking monitor output)
Adjusting point	————
Specification	T = 14.78 ± 0.46 msec.

1. Insert the alignment tape (VROCPSV) and put the unit in the palyback mode.
2. Make sure that the "H" level time (T) at TP702 (tracking monitor output) is 14.78 ± 0.46 msec. Now go to the X positon adjustment.

Tracking monitor output (TP702)

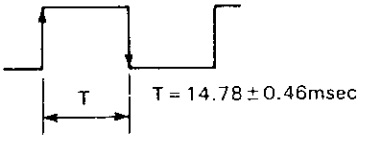


Figure 2-3.

ADJUSTMENT OF Y/C CIRCUIT

- **Test point layout**

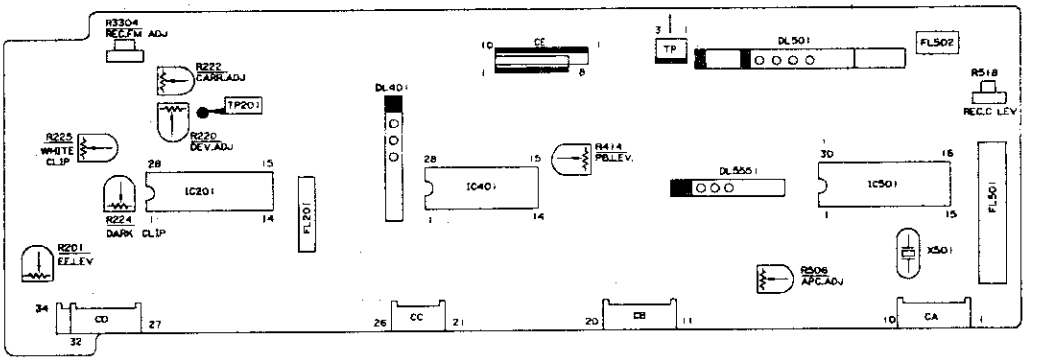
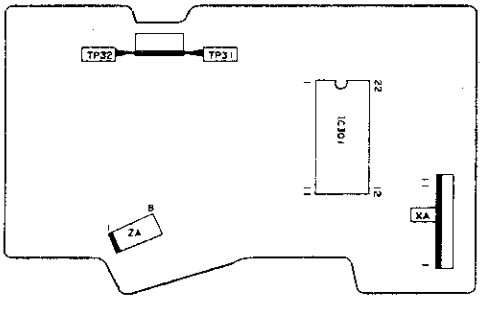


Figure 2-4. Y/C PWB



HEAD AMP PWB

Figure 2-5.

■ ADJUSTMENT OF Y/C RECORDING CIRCUIT

Adjustment of EE level

Measuring instrument	Oscilloscope
Mode	SP recording
Input signal	Standard colour bar (stair-case waveform)
Test point	Video output terminal
Adjusting point	R201 (EE level control)
Specification	1.0 ± 0.05 Vp-p

Note:
The video output terminal should be terminated with a 75-ohm impedance.

1. Set the unit to the SP record mode.
2. Feed the colour bar signal(stair-case waveform) to the video input terminal. Observing the voltage across the terminal resistor of the video output terminal on the oscilloscope screen, adjust R201 (EE level control) to obtain the value indicated in Fig. 2-6.

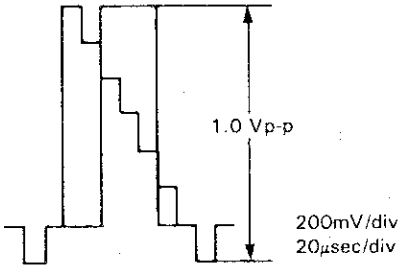


Figure 2-6.

Ajustment of FM 3.8 MHz and 4.8 MHz

Measuring instrument	Frequency counter	Oscilloscope
Mode	Recording	Self-recording / playback
Input signal	External input (no signal)	Standard colour bar (stair-case waveform)
Test point	Pin 28 of IC201	Video output, terminal
Adjusting point	R222 (FM carrier control)	R220 (deviation control)
Specification	3.8 MHz	1.0 ± 0.05 Vp-p

Note. 1:
Carry out this adjustment only when IC201 has been replaced or when the carrier setting (3.8 MHz) or the deviation (4.8 MHz) is found apparently out of specification.

Make this adjusment after the EE level has been completely adjusted.

Note. 2:
The video output teminal should be terminated with a 75-ohm impedance.

1. First make sure that the EE level playback video signal is at the speciffied level.
2. Place the unit in the record mode and get it ready for external input.
   Note:
   Do not connect anything to the external input terminal.
3. Hook up the frequency counter to pin 28 of IC201. Adjust R213 (FM carrier control) so that the counter reading be 3.8 MHz.
   Note:
   Make sure the white and dark clip controls are not now applied to the waveform.
4. Feed the colour bar signal (stair-case waveform) and make self-recording and playback.
5. Observe the video output terminal voltage (across the terminal resistor) on the oscilloscope screen. If the playback video signal level is below 1.0 Vp-p, turn R220 (deviation control) counter-clockwise. If above 1.0 Vp-p, turn the control clockwise. Now make self-recording and play-back again.
6. Repeat the above step 5 to finally get the playback video signal level at 1.0 ± 0.05 Vp-p, as shown in Fig. 2-5.

Adjustment of white clip

Measuring instrument	Oscilloscope
Mode	Recording
Input signal	Standard colour bar (stair-case waveform)
Test point	TP201
Adjusting point	R225 (white clip control)
Specification	80 $^{+\ 0}_{-\ 4}$ %

1. Place the unit to the record mode.
2. Feed the colour bar (stair-case waveform) signal.
3. Observing the output at TP201, adjust R225 (white clip control) so that the white peak overshoot be 80% (tolerance: + 0%, - 4 %)

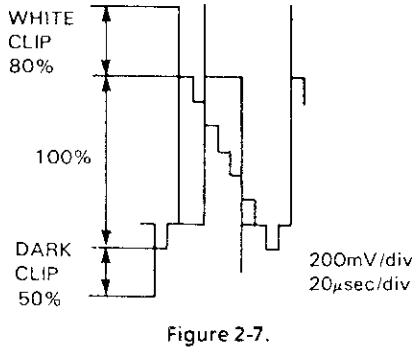


Figure 2-7.

Adjustment of dark clip

Measuring instrument	Oscilloscope
Mode	Recording
Input signal	Standard colour bar (stair-case waveform)
Test point	TP201
Adjusting point	R224 (dark clip control)
Specification	40 ± 4%

1. Place the unit to the recording mode.
2. Feed the colour bar (stair-case waveform) signal.
3. Observing the output at TP201, adjust R224 (dark clip control) so that the dark peak overshoot be 40 ± 4%. (See fig. 2-7.)

Adjustment of recording current

Measuring instrument	Oscilloscope	
Mode	Recording (LP mode)	
Input signal	Standard colour bar (stair-case waveform)	
Test point	TP301 (GND at TP302) External trigger (video output terminal)	
Adjusting point	R3304 (recording FM control)	R518 (recording chroma control)
Specification	Sync tip level 100 ± 10mVp-p	Red level 20 ± 1mVp-p

Note:
TP301 and TP302 are located on the head amp PWB.

1. Place the unit to the record mode (LP mode).
2. Feed the colour bar (stair-case waveform) signal.
3. Observing the waveform on the oscilloscope screen (external trigger at video output terminal), take the following steps.
   a) Connect the oscilloscope's GND and SIG leads to TP302 and TP301, respectively.
   b) Turn R3304 (recording FM control) to minimum.
   c) Ajust R518 (recording chroma control) to that the red level be 20 ± 1mVp-p as shown in Fig.2-8.
4. Adjust R3304 (recording FM control) so that the sync tip be 100 ± 10mVp-p as shown in Fig.2-9.

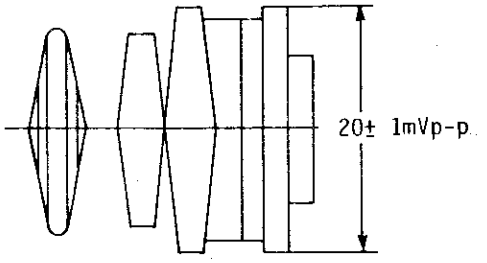


Figure 2-8.

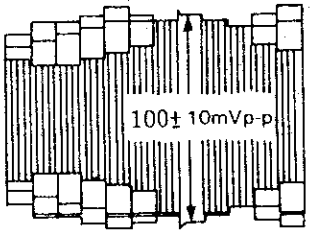


Figure.2-9.

■ ADJUSTMENT OF Y/C PLAYBACK CIRCUIT

Adjustment of playback video signal level

Measuring instrument	Oscilloscope
Mode	Playback
Tape used	Alignment tape (stair-case waveform)
Test point	TP201
Adjusting point	R414 (playback level control)
Specification	1.0 ± 0.05Vp-p

Note:
The video output terminal should terminated with a 75-ohm impedance.

1. Insert the alignment tape (stair-case waveform) and place the unit to the playback mode.
2. Hook up the oscilloscope to the video output terminal. Adjust R414 (playback level control) so that the on-screen waveform be 1.0 ± 0.05Vp-p.

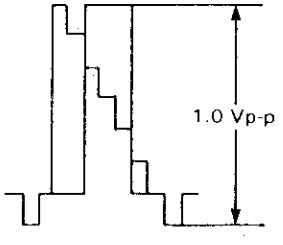


Figure 2-10.

Adjustment of APC

Measuring instrument	Frequency counter
Mode	Playback
Tape used	Alignment tape (VROCPSV)
Test point	Pin ⑦ of CA connector
Adjusting point	R506
Specification	4.433619MHz ± 50Hz

1. Insert the alignment tape (VROCPSV) and place the unit to the playback mode.
2. Connect the frequency counter to pin ⑦ of CA connector. Adjust R506 (APC control) so that the counter reading be 4.433619MHz ± 50Hz.

ADJUSTMENT OF AUDIO CIRCUIT

- **Test point layout**

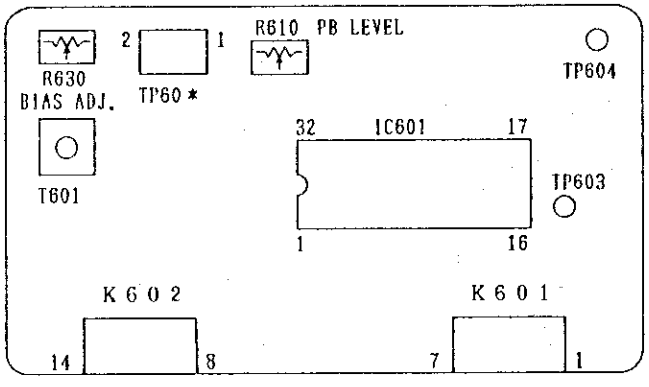


Figure 2-11. AUDIO PWB

Adjustment of playback level

Measuring instrument	VTVM
Mode	Playback
Input signal	Alignment tape (VROCPSV) (1-kHz level control signal)
Test point	Audio output terminal
Adjusting point	R610 (playback level control)
Specification	-9 ± 0.5dBm

1. Play back the alignmenr tape (1-kHz level control signal).
2. Hook up the VTVM to the audio output terminal.
3. Adjust R610 (playback level control) so that the output level be -9 ± 0.5dBm.

Checking of erase voltage and oscillation frequency

Measuring instrument	Oscilloscope
Mode	Recording
Input signal	————
Test point	Both ends of the full-erase head
Adjusting point	————
Specification	Erase voltage; Over 40 Vp-p Oscillation frequency; 70 ± 7kHz

1. Place the unit to the record mode.
2. Hook up the oscilloscope to both ends of the full-erase head.
3. Make sure the erase voltage is over 40 Vp-p.
4. Be sure that the oscillation frequency is 70 ± 7kHz.

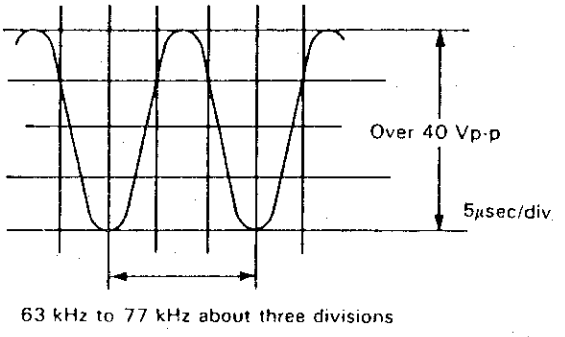


Figure 2-12.

Adjustment of bias current

Measuring instrument	VTVM
Mode	Recording
Input signal	————
Test point	TP601 (SIG), TP602 (GND)
Adjusting point	R630 (bias current control)
Specification	260 ± 10 μA

1. Place the unit to the record mode.
2. Connect the VTVM to TP601 (SIG) and TP602 (GND).
3. Adjust R630 (bias current control) so that the bias current be 260 ± 10 μA (2.6 ± 0.1mV).

Checking of recording level

Measuring instrument	VTVM
Mode	Self-recording /playback
Input sigual	1 kHz / -8 dBm
Test point	Audio output terminal
Adjiusting point	————
Specification	-5 ± 3 dBm

1. Feed 1kHz, -8 dBm signal to the audio input terminal. Make self-recording and playback of the signal.
2. Make sure the output at the audio output terminal is -5 ± 3 dBm.
3. If out of spec, readjust the playback level and the bias current.

ADJUSTMENT OF IF CIRCUIT

Adjustment of RF AGC

Measuring instrument	Oscilloscope
Mode	————
Input signal	Colour bar signal
Test point	Video output terminal
Adjusting point	VR001 (RF AGC)
Specification	————

1. Receive the colour bar signal (input field strength: 80 dBμ).
2. Observe the video output terminal waveform on the oscilloscope. Adjust VR001 (RF AGC) in the IF pack until the noise disappers from the oscilloscope screen and the wavefrom nearly comes into sync.

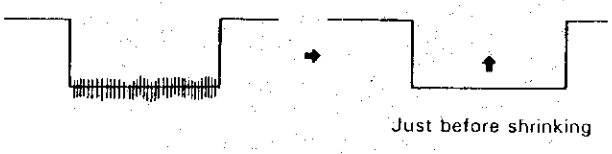


Figure 2-13.

Adjustment of AFT

Measuring instrument	Oscilloscope Signal generator
Mode	————
Input signal	PIF frequency uniwave 36.875 MHz Colour bar signal (70dBμ)
Test point	Video output terminal
Adjusting point	T002 (AFT coil)
Specification	————

1. Receive the colour bar signal (input field strength: 70 dB μ).
2. Set the AFT switch ON position (Tuning switch is normal position).
3. Using the signal generator, feed the 36.875-MHz PIF frequency signal to the tuner IF output terminal.
   (Adjust the attenuator to attenuate the input signal down to an appropriate level).
4. Adjust T002 (AFT coil) in the IF pack so that the video output terminal waveform be minimum.

• ADJUSTMENT OF ON-SCREEN DISPLAY (O.S.D.) CIRCUIT

THE ON-SCREEN DISPLAY system is designed to display at a time and confirm program ON., channel, week/day, starting time and iength on the TV monitor screen, though they were displayed and confirmed on the fluorescent tube of timer.

Position (lateral) of program characters

After setting to OSD mode, display the content of the program on the monitor screen, and adjust the trimmer C5904 (on the main PWB) so that the program characters (program NO., channel, week/day, starting time and length) are arranged properly on the screen.

Adjustment of Digital Circuit

Write phase adjustment

1. Set the unit to the EE STROBE mode.

Note:

Do not use the AUX input or MULTI STROBE mode.

2. Input a colour bar signal.
3. Connect an oscilloscope to TP2801 and adjust C2804 (Write Phase Adj.) for a duty cycle of 50 ±10%. (Fig. 2-14)

Read phase adjustment

1. Set the unit to the EE STROBE mode.

Note:

Do not use the AUX input or MULTI STROBE mode.

2. Input a colour bar signal.
3. Connect an oscilloscope to TP2802 and adjust C2810 (Read Phase Adj.) for a duty cycle of 50 ±10%. (Fig. 2-14)

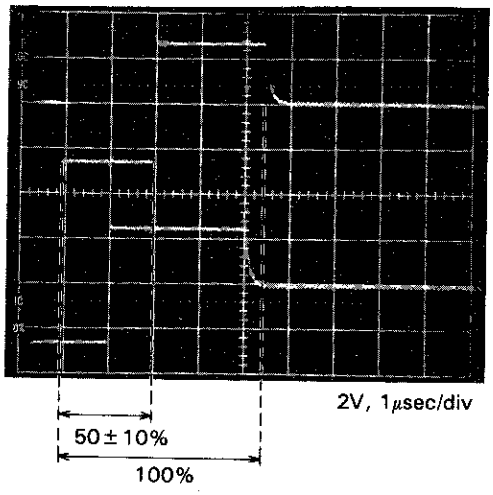


Figure 2-14

Picture position adjustment

1. Alternate between the EE and STROBE modes.
2. Input a colour bar signal.
3. While alternating between the EE and STROBE modes, adjust C2804 (Write Phase Adj.) and C2810 (Read Phase Adj.) so that the colour bar stops at the right and left position and shift is eliminated. (Fig. 2-15)

Note:

Adjust the trimmer carefully, as excessive change will impair the memory picture.

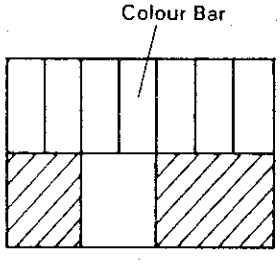


Figure 2-15

Sub 4.43 MHz adjustment

1. Set the unit to the EE(Aux) mode so that nothing is input to the Video in terminal.
2. Set the color mode switch to OFF. (Blue mute OFF)
3. Connect a frequency counter to TP2606 (GND) and TP2605 (Sub 4.43 MHz) and adjust C2609 (Sub 4.43 MHz Adj.) to obtain a frequency counter reading of 4433.62 ±0.02 kHz at TP2605. (Fig. 2-16)

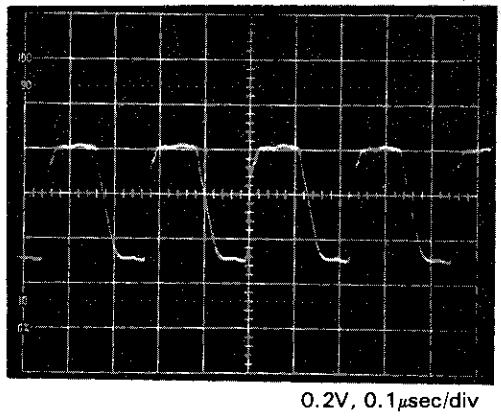


Figure 2-16

Master 4.43 MHz adjustment

1. Set the unit to the EE(AUX) mode so that nothing is input to the Video in terminal.
2. Set the color mode switch to OFF. (Blue mute OFF)
3. Connect a frequency counter to TP2702 (GND) and TP2701 (Master 4.43 MHz) and adjust C2727 (Master 4.43 MHz Adj.) to obtain a frequency counter reading of 4433.62 ±0.02 kHz at TP2701. (Fig. 2-17)

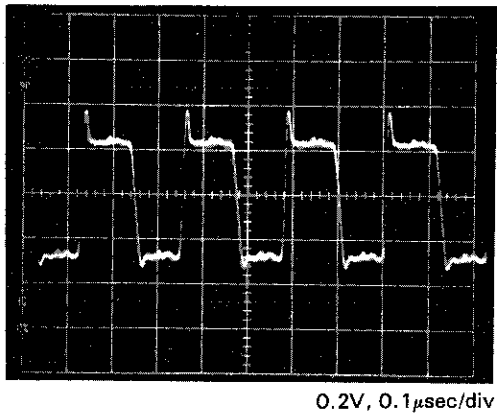


Figure 2-17

Initial set adjustment

1. Set the unit to the AUX mode.
2. Input a colour bar signal.
3. Connect an oscilloscope as follows:
   - Connect CH-2 probe to TP2601 (B-Y)
   - Connect CH-1 probe to TP2602 (R-Y).
   - Connect TP2603 to ground.
   - Connect the trigger (TRG EX) to TP2604 (Write H Blank).
4. Adjust R2606 (Colour Level Adj.) so that the R-Y waveform becomes approximately 1 Vp-p. (Fig. 2-18)

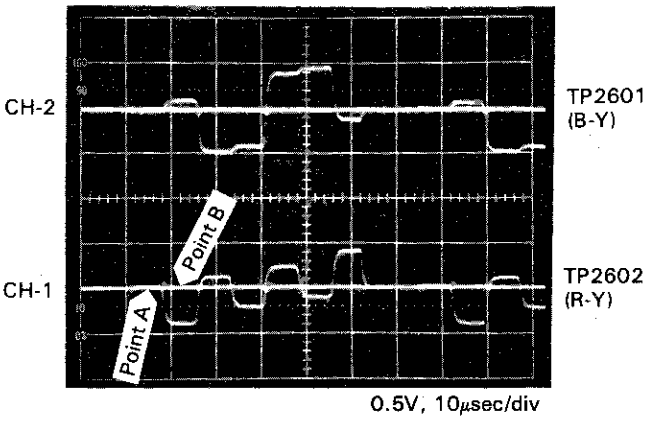


Figure 2-18

Burst phase adjustment

1. Set the unit to the AUX mode.
2. Input a colour bar signal.
3. Connect an oscilloscope as follows:
   - Connect CH-2 probe to TP2601 (B-Y).
   - Connect CH-1 probe to TP2602 (R-Y).
   - Connect TP2603 to ground.
   - Connect the trigger (TRG EX) to TP2604 (Write H Blank).
4. Adjust R2631 (Burst Phase Adj.) with an oscilloscope so that cracking in point A of Fig. 2-18 is minimized.

1H gain adjustment

1. Set the unit to the AUX mode.
2. Input a colour bar signal.
3. Connect an oscilloscope as follows:
   - Connect CH-2 probe to TP2601 (B-Y).
   - Connect CH-1 probe to TP2602 (R-Y).
   - Connect TP2603 to ground.
   - Connect the trigger (TRG EX) to TP2604 (Write H Blank).
4. Adjust R2619 (1H Gain Adj.) with an oscilloscope so that cracking in point B of Fig. 2-18 is minimized.

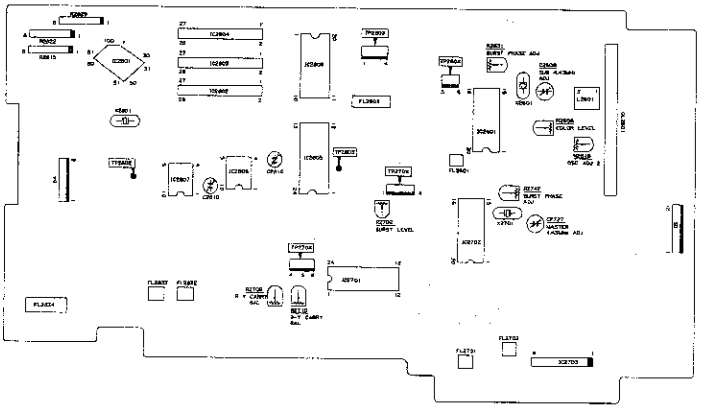


Figure 2-19

1H phase adjustment

1. Set the unit to the AUX mode.
2. Input a colour bar signal.
3. Connect an oscilloscope as follows:
   - Connect CH-2 probe to TP2601 (B-Y).
   - Connect CH-1 probe to TP2602 (R-Y).
   - Connect TP2603 to ground.
   - Connect the trigger (TRG EX) to TP2604 (Write H Blank).
4. Adjust L2601 (1H Phase Adj.) with an oscilloscope for minimum overall blur of the R-Y waveform. (Fig. 2-18)

B-Y output precise adjustment

1. Set the unit to the AUX mode.
2. Input a colour bar signal.
3. Connect an oscilloscope as follows:
   - Connect CH-2 probe to TP2601 (B-Y).
   - Connect CH-1 probe to TP2602 (R-Y).
   - Connect TP2603 to ground.
   - Connect the trigger (TRG EX) to TP2604 (Write H Blank).
4. Repeat burst phase adjustment, 1H gain adjustment, and 1H phase adjustment with R2631, R2619, and L2601, until cracking and blur of the waveform are minimized. (Fig. 2-18)

Colour level adjustment

1. Set the unit to the AUX mode.
2. Input a colour bar signal.
3. Connect an oscilloscope as follows:
   - Connect the probe (CH-1 AC) to TP2602 (R-Y).
   - Connect TP2603 to ground.
   - Connect the trigger (TRG EX) to TP2604 (Write H Blank).
4. Adjust R2606 (Colour Level Adj.) so that the R-Y waveform amplitude becomes 1 ±0.04 Vp-p. (Fig. 2-18)

Carrier balance adjustment

1. Set the unit to the EE (AUX) STROBE mode.
2. Input a color bar signal.
3. Connect an oscilloscope as follows:
   - Connect TP2702 to ground.
   - Connect a probe to TP2703 (Chroma).
   - Connect the trigger (TRG EX) to TP2704 (C Sync).
4. Adjust R2710 (B-Y Carry BAL.) and R2709 (R-Y Carry BAL) using a alternately to minimize noise at point A in Fig. 2-20.

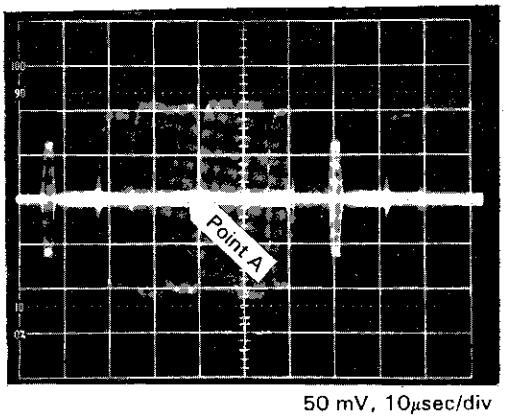


Figure 2-20

Burst level adjustment.

1. Set the unit to the EE(AUX) STROBE mode.
2. Input a color bar signal.
3. Connect an oscilloscope as follows:
   - Connect TP2702 to ground.
   - Connect a probe to TP2703 (Chroma).
   - Connect the trigger (TRG EX) to TP2704 (C Sync).
4. Adjust R2702 (Burst Level Adj.) so that the Burst waveform amplitude becomes 95±5mVp-p (Fig. 2-21)

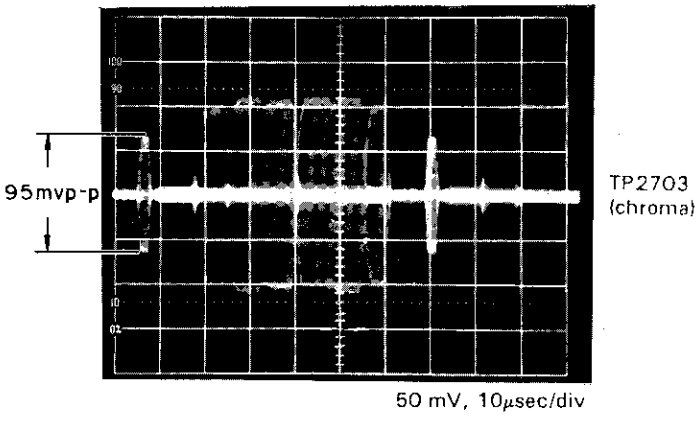


Figure 2-21

Burst level precise adjustment.

1. Set the unit to the STROBE (TUNER) mode.
2. Input a video signal which contains a picture of a human.
3. Switch between the STROBE and EE mode and adjust R2702 (Burst Level Adj.) so that colour depth on the monitor is identical in both modes.

Note:

It is preferable to use the video input of the monitor.

Colour phase adjustment of picture in picture

1. Set the unit to the EE (AUX) Picture in Picture mode.
2. Input a video signal which contains a picture of a human.
3. Adjust R2742 (Burst Phase Adj. Pin P) so that the colour phase of main picture and sub picture is identical.

Note:

It is preferable to use the video input of the monitor.

● H-S Detection Circuit

PLL frequency adjustment: R1416

1. Connect the frequency counter to the fosc pin of TP 1402 after passing through the buffer shown in the figure on the left.
2. Connect 1μ (50V) between TP1403 and the GND. (Remove the connection after completing adjustment.)
3. Adjust R1416 so that the value of the counter display becomes 15.625 kHz.

Within ±50 Hz

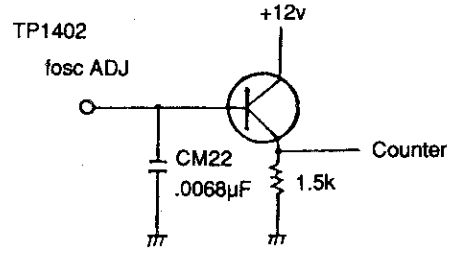


Figure 2-22

TROUBLESHOOTING GUIDE

■ TROUBLES OF CONTROL SYSTEM (SERVO, SYSTEM CONTROLLER CIRCUIT)

No.	Problems	Probable causes and countermeasures
1.	No power is supplied.	• The fuse is blown out; check if there occurs a shortcircuit in the internal circuit. • Check if there are produced AT5V, Motor 12V and AT9V in the power circuit; if not, this means that the power circuit is defective. • Check if the system controller (IC801) is normally functioning; check if there are produced reset signals (ACL) at pin **45** of IC801 and clock signal at pins **46** and **47** of IC801. • Check if the power control signal (Low level) goes out of pin **19** of IC801.
2.	No operation is available.	• Check if the end sensor signal (cassette housing side) and start sensor signal are applied to pins **56** and **57** of IC801 respectively. • Check if the unit is in timer mode. • Check if the unit is in sensor stop mode. • The cam switch is poorly adjusted for its positioning.
3.	After tape lading, the unit is stopped with the tape kept would over the drum, or the cassette can't be ejected.	• The cam switch is poorly adjusted for its positioning. • IC803 is defective.
4.	The unit will stop immediately after it is set in playback or record mode.	• Check if the head switching pulse is applied to pin **3** (for the drum sensor) of IC801. • Check if the drum motor is rotating. • Check if the drum PG signal and drum FG signal are applied to pin **4** and **5** of the servo circuit IC701
5.	The unit will stop a few seconds after it has been set in playback or record mode.	• Check if the reel sensor pulse is applied to pin **58** (for the reel sensor) of IC801. • Check if the reel motor is rotating. • Check if the reel idler is stained or defective.
6.	The tape is not running (the tape is not taken up).	• The reel idler is defective. • The reel brake is defective.
7.	• The unit stops sometimes during playback or recording. • The tape can't be taken up when tape unloading. • The tape is scratched when it is wound. • Video search is impossible.	• Check if there are produced capstan motor control signals at the system controller (servo clock signal **38** of IC801, servo data signal at **39** of IC801, capstan motor pull up signal at pin **29** of IC801, capstan motor unloading signal at pin **30** of IC801, loading motor control forward signal at pin **63** of IC801, loading motors revese control signal at pin **62** of IC801). • The video search circuit is defective. • IC701 and IC702 are defective.
8.	Fine noises appear at the reproduced picture.	• The playback phase generator MM control is misadjusted (R740).

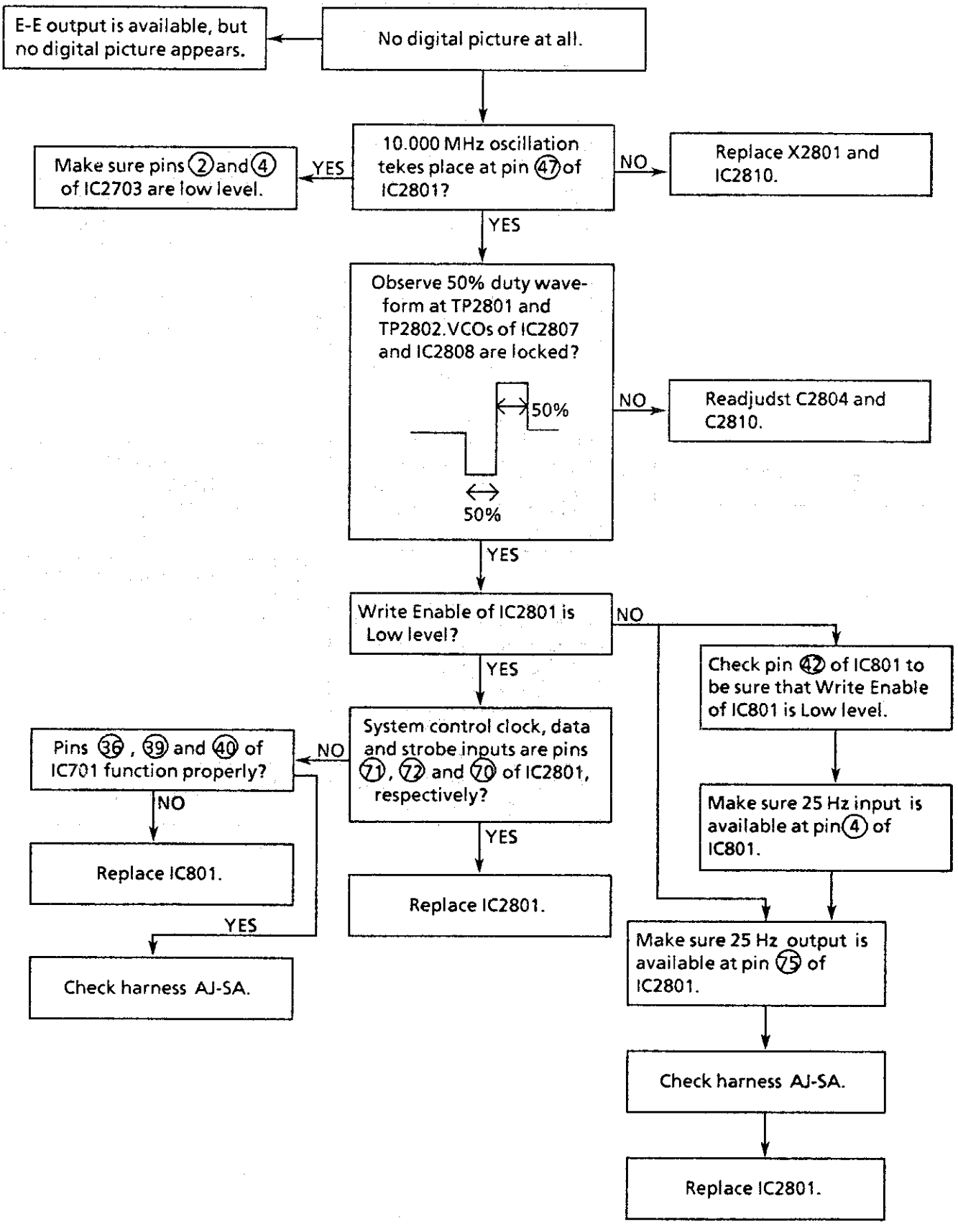
No.	Problems	Probable causes and countermeasures
9.	Noises appear intermittently at the reproduced picture.	• Check for capstan servo circuit (capstan frequency generator's signal at pin **11** of IC701 and playback control signal at pin **42** of IC701)
10.	The picture collapses in the horizontal direction.	• The drum servo circuit is defective. • Check if there are drum frequency generator's signal applied to pin **7** of IC701 and drum phase generator's signal to pin **4** of IC701. • Check if there is reference signal (4.43MHz) at pin **22** of IC701.

- TROUBLES OF SOUND AND REPRODUCED PICTURE (Y/C AND AUDIO CIRCUIT)

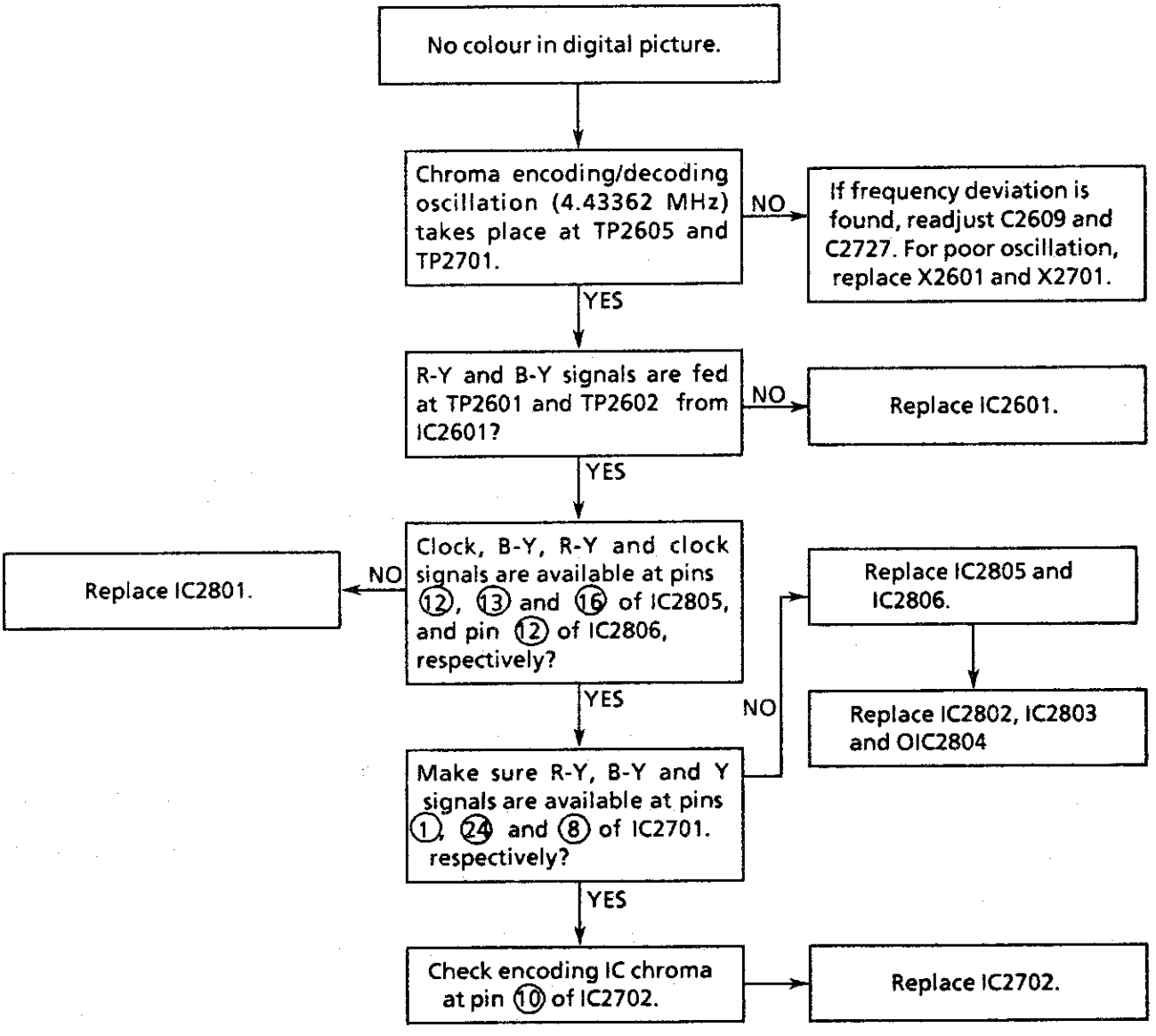
No.	Problems		Probable causes and countermeasures
1.	No picture appears.	At E-E mode	• Check if the video signal (E-E signal) is applied to pin **4** of IC201, if the video signal goes out of pin **10**, and if proper voltage is applied to each pin of IC201). • Check if the video signal comes into pin **3** of IC2201 and goes out of pin **8** of IC2201 (in tuner mode). • Check if the E-E (L) signal is at low level at pin **26** of connector AX and pin **7** of IC2201.
		At playback of standard tape.	Make sure that there appears a normal picture at E-E mode. • Check if the playback FM signal is applied to pin **4** of connector CE. • Check if the playback FM signal is applied to pins **20** and **21** of IC301. • Check if Vcc 5V is applied at pin **8** of IC401. • Check if the video signal (demodulator output) is given at pin **16** of IC401. • Check if the video signal is given at pin **1** of IC401. • Check if the base of Q202 is at high level (about 4V).
		At playback of the tape recorded by oneself.	Before this checking, make sure that normal playback is possible with standard tape. • Check if there is FM signal at pin **16** of IC401. • Check if there is video signal at pin **6** of IC201. • Check if there is video signal at pin **10** of IC201.
	No colour appears.		• Check if there is chroma signal at pin **30** of IC501. • APC is misadjusted (R506). It is not allowed to readjust them, this means that IC501 is defective. • Check if IC501 is normally functioning.
3.	The picture collapses when the tape recorded by oneself is played back.		• Check if there is a normal voltage at each pin of the head amplifier.
4.	Noises appear on the whole of picture when the tape recorded by oneself is played back.		• Check if there is a normal voltage at each pin of the head amplifier • Check the video head or replace it a new one.

No.	Problems	Probable causes and countermeasures
5.	Noises is noticeable at E-E mode or when the tape recorded by oneself is played back.	• The tuner and/or RF converter are defective. • Check if AT 5V is applied at pin **5** of the RF converter. • Check the coaxial cable between the tuner and the RF converter for breakage. • Disconnect the antenna cable to see if the DC voltage at the tuner's AGC terminal goes above 6V.
6..	Noise appear on the picture when the tape is played back with standard tape.	• Clean the video head or replace it a new one.
7.	There appears no E-E sound.	• First make sure the E-E picture appears as specified.(If not, the muting effect is produced.) • ALC at IC601 operates improperly. • Check if there is audio signal at pin **17** of IC601 • The audio muting circuit is defective.
8.	There appears no sound at playback mode.	• The audio head is defective. • Check if the control signal is applied. • (If not, the muting effect is produced. • Ckeck if playback audio signal is applied to pin **7** of IC601 and goes out of pin **17**.
9.	Sound is distorted.	• The audio head is magnetized or defective. • Bias current is insufficient.
10.	The reasonance in the recording or playback is incorrect.	• The audio head is magnetized or defective. • Bias oscillator circuit is defective.
11.	Recording is impossible.	• Bias oscillator circuit is not normally functioning. • Ckeck if pin **12** of K602 (bias control 9V) is at high level.
12.	Noise and hum appear frequently during playback or recording.	• The audio head is defective.

DIGITAL MEMORY (1) TROUBLESHOOTING


No digital picture at all.
E-E output is available, but no digital picture appears.
10.000 MHz oscillation tekes place at pin (47) of IC2801?
YES
NO
Make sure pins (2) and (4) of IC2703 are low level.
Replace X2801 and IC2810.
Observe 50% duty wave-form at TP2801 and TP2802.VCOs of IC2807 and IC2808 are locked?
50%
50%
NO
Readjudst C2804 and C2810.
YES
Write Enable of IC2801 is Low level?
NO
YES
Check pin (42) of IC801 to be sure that Write Enable of IC801 is Low level.
Make sure 25 Hz input is available at pin (4) of IC801.
System control clock, data and strobe inputs are pins (71), (72) and (70) of IC2801, respectively?
NO
YES
Pins (36), (39) and (40) of IC701 function properly?
NO
Replace IC801.
YES
Check harness AJ-SA.
Replace IC2801.
Make sure 25 Hz output is available at pin (75) of IC2801.
Check harness AJ-SA.
Replace IC2801.

DIGITAL MEMORY (2) TROUBLESHOOTING


No colour in digital picture.
Chroma encoding/decoding oscillation (4.43362 MHz) takes place at TP2605 and TP2701.
NO
If frequency deviation is found, readjust C2609 and C2727. For poor oscillation, replace X2601 and X2701.
YES
R-Y and B-Y signals are fed at TP2601 and TP2602 from IC2601?
NO
Replace IC2601.
YES
Clock, B-Y, R-Y and clock signals are available at pins (12), (13) and (16) of IC2805, and pin (12) of IC2806, respectively?
NO
Replace IC2801.
Replace IC2805 and IC2806.
YES
NO
Replace IC2802, IC2803 and OIC2804
Make sure R-Y, B-Y and Y signals are available at pins (1), (24) and (8) of IC2701. respectively?
YES
Check encoding IC chroma at pin (10) of IC2702.
Replace IC2702.

SCHEMATIC DIAGRAM

IMPORTANT SAFETY NOTICE:
BE SURE TO USE GENUINE PARTS FOR SECURING THE SAFETY AND RELIABILITY OF THE SET. PARTS MARKED WITH "⚠" AND PARTS SHADED (IN BLACK) ARE ESPECIALLY IMPORTANT FOR MAINTAINING THE SAFETY AND PROTECTING ABILITY OF THE SET.
BE SURE TO REPLACE THEM WITH PARTS OF SPECIFIED PART NUMBER.

SAFETY NOTES:

1. *DISCONNECT THE AC PLUG FROM THE AC OUTLET BEFORE REPLACING PARTS.*
2. *SEMICONDUCTOR HEAT SINKS SHOULD BE REGARDED AS POTENTIAL SHOCK HAZARDS WHEN THE CHASSIS IS OPERATING.*

NOTES:

1. *The unit of resistance "ohm" is omitted (k = 1000 ohm, M = 1 Meg ohm).*
2. *All resistors are 1/8 watt, unless otherwise noted.*
3. *The unit of capacitance "F" is omitted (μ = μF, p = μμF).*
4. *The values in parentheses are the ones in the PB mode; the values without parentheses are the ones in the REC mode.*

VOLTAGE MEASUREMENT CONDITIONS:

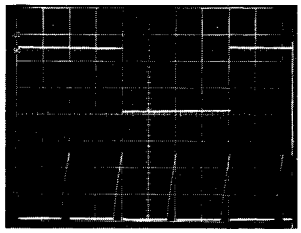
1. *DC voltages are measured between points indicated and chassis ground by VTVM, with AC240V (VC-D805H), 220V (VC-D805W) /50Hz supplied to unit and all controls are set to normal viewing picture unless otherwise noted.*
2. *Voltages are measured with 10000μV B & W or colour signal.*

WAVEFORM MEASUREMENT CONDITIONS:
10000μV 87.5 percent modulated colour ber signal is fed into tuner.

CAUTION:
This circuit diagram is original one. Therefore there may be a slight difference from yours.

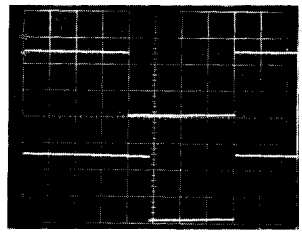
WAVE FORMS

SYSTEM CONTROL, SERVO, IF PWBs



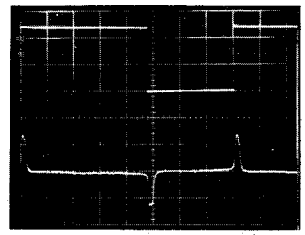
TP701 (1) pin
Head switching pulse
2V/Division
5msec/Division

IC701 (27) pin
Drum pulse generator
1V/Division
5msec/Division



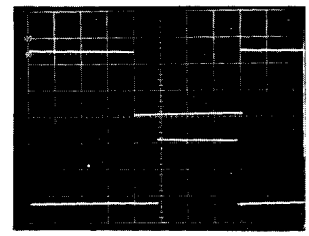
TP701 (1) pin
Head switching pulse
2V/Division
5msec/Division

TP701 (2) pin
Tracking MM pulse
2V/Division
5msec/Division
– Record mode –



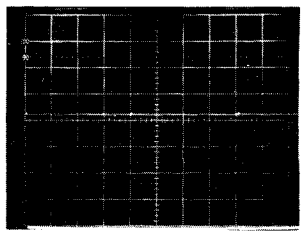
TP701 (3) pin
Playback control pulse
2V/Division
5msec/Division

IC701 (42) pin
Playback control signal
500mV/Division
5msec/Division

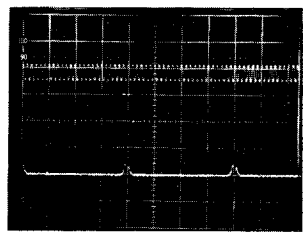


TP701 (1) pin
Head switching pulse
2V/Division
5msec/Division

TP701 (2) pin
Tracking MM pulse
2V/Division
5msec/Division
– Playback mode –

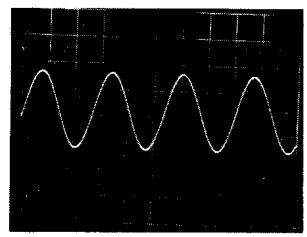


IC701 (30) pin
Horizontal sync pulse
1V/Division
5msec/Division

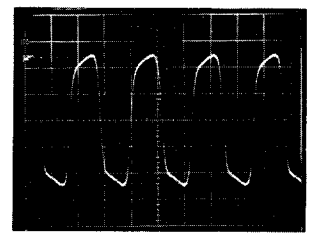


Socket AM (9) pin
Drum frequency generator signal
50mV/Division
10msec/Division

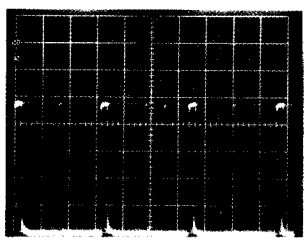
Socket AM (12) pin
Drum phase generator pulse
200mV/Division
10mV/Division



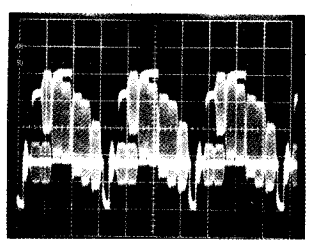
Socket AM (15) pin
Capstan frequency generator signal
500mV/Division
0.5msec/Division



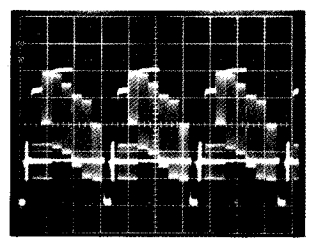
Plug AV (9) pin
4.43MHz oscillation signal
200mV/Division
0.1μsec/Division



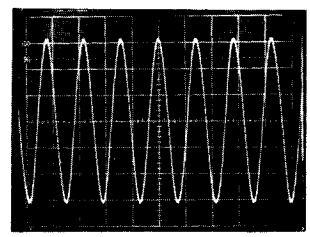
TP2201
Horizontal sync pulse
1V/Division
20μsec/Division
– Record mode –



Video output terminal
(Video output is shorted with a 75 ohm resistor.)
Video signal
200mV/Division
20μsec/Division
– Playback mode –

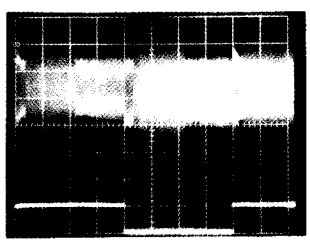


Video output terminal (E-E level)
(Video output is shorted with a 75 ohm resistor.)
Video signal
200mV/Division
20μsec/Division
– Record mode –



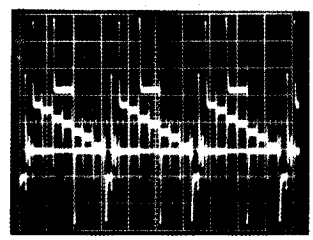
K602 (9), (11) pin
(Between audio erase head and ground)
10V/Division
10μsec/Division
– Record mode –

Y/C, PWB



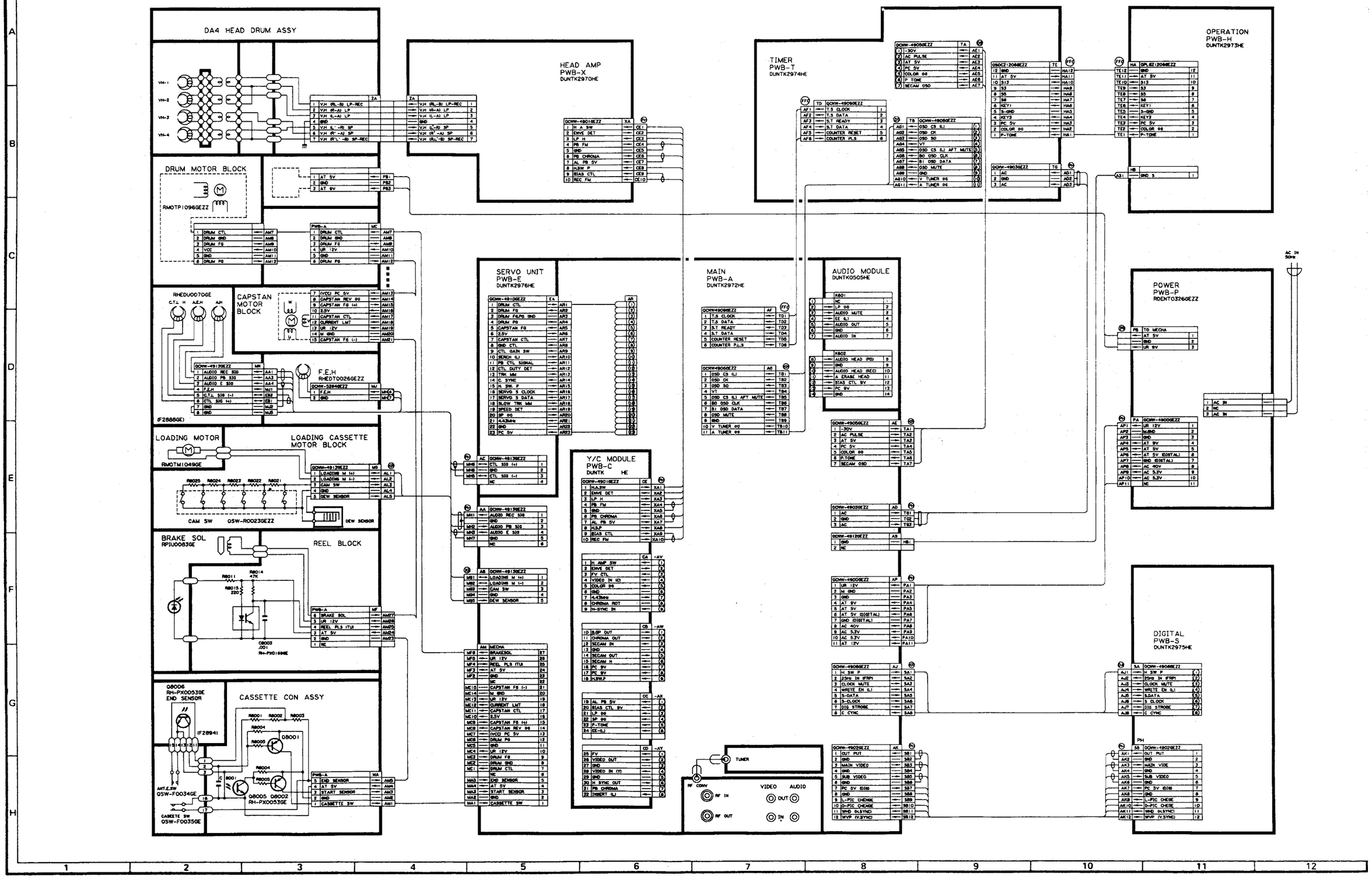
TP1
Playback preamp. signal
50mV/Division
5msec/Division

TP2
Head switching pulse
5V/Division
5msec/Division
– Playback mode –
(color bar)

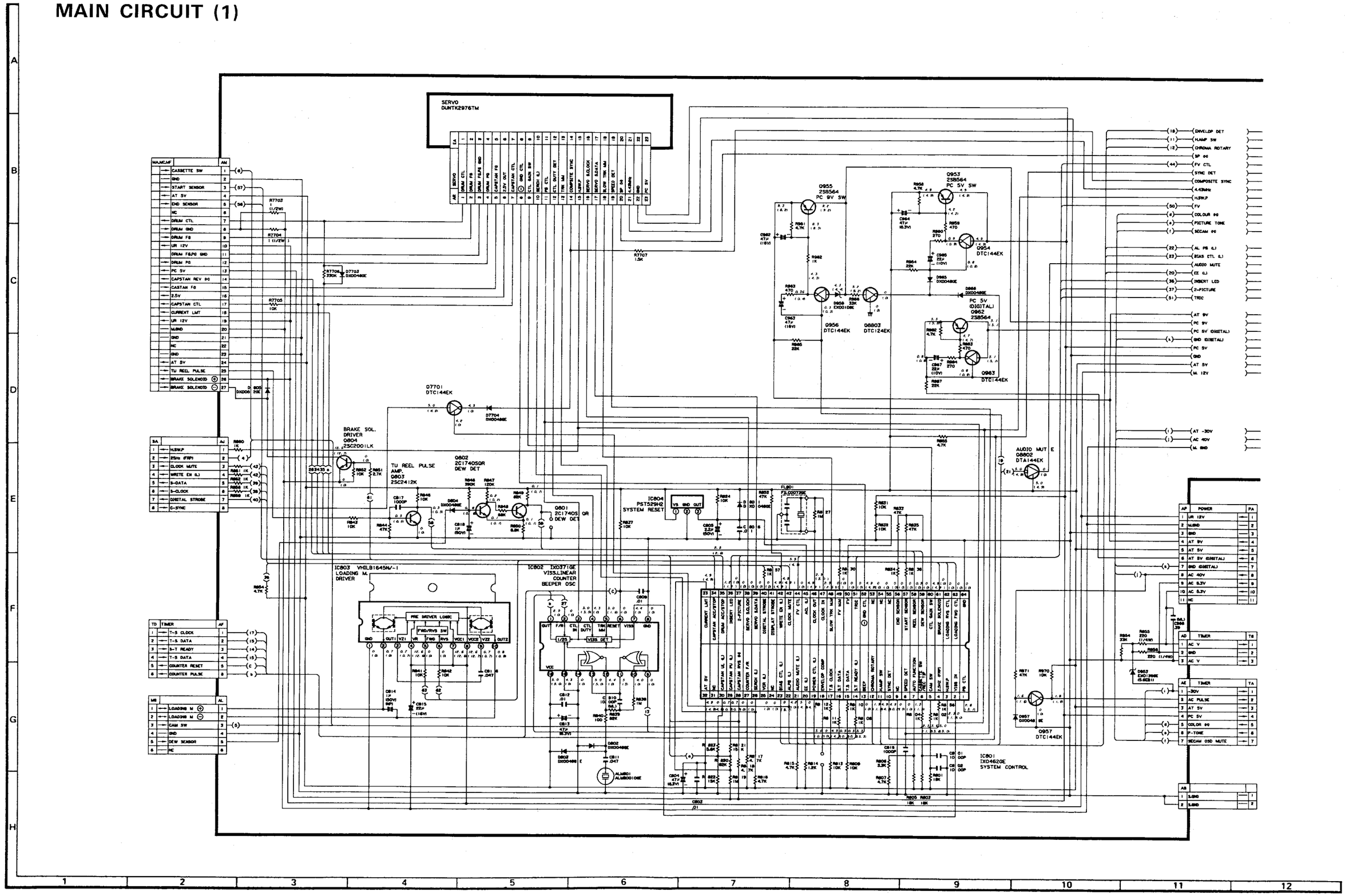


TP201
White/Dark clip signal
100mV/Division
20μsec/Division
– Record mode –

OVERALL SCHEMATIC DIAGRAM

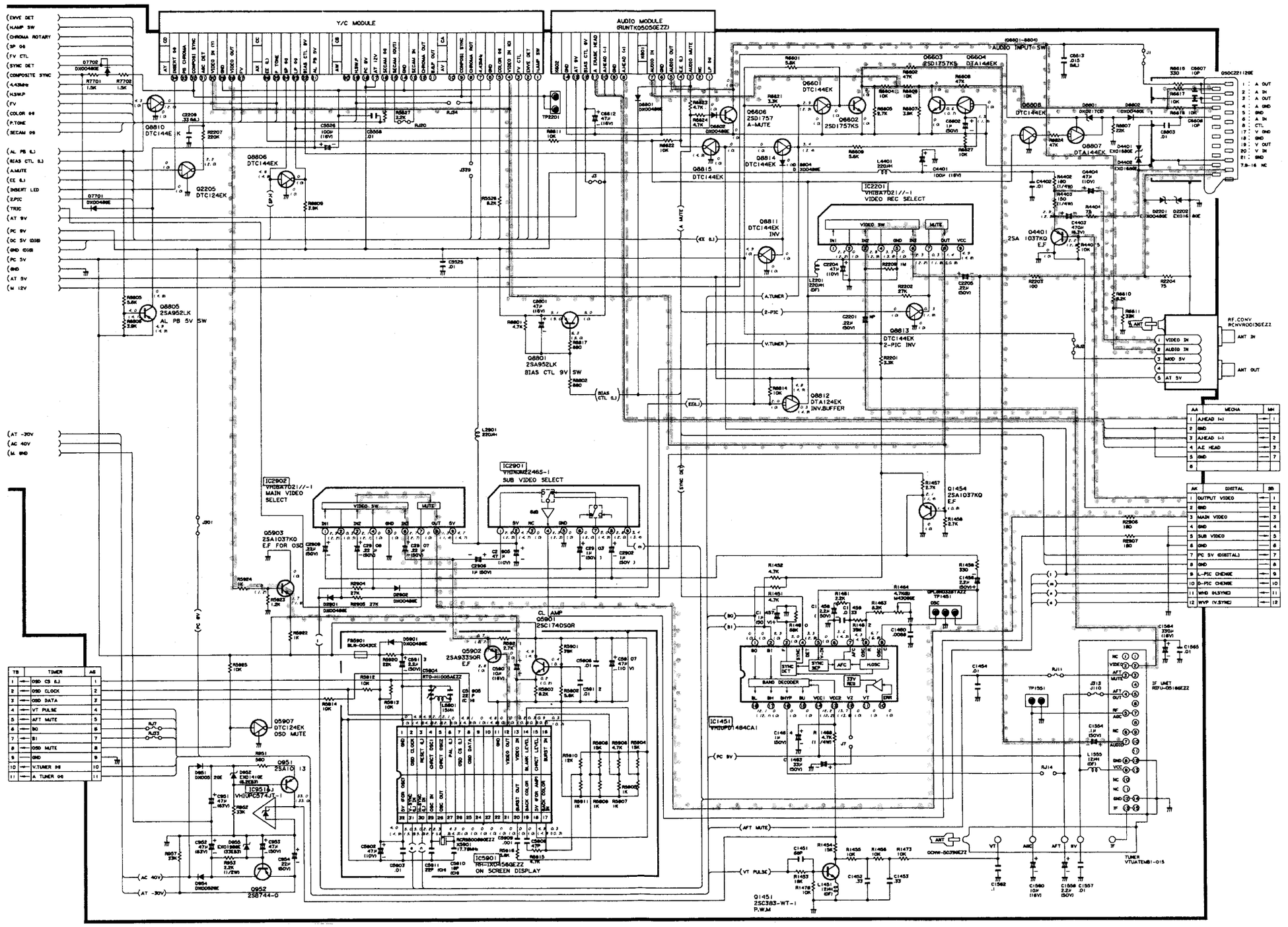


MAIN CIRCUIT (1)

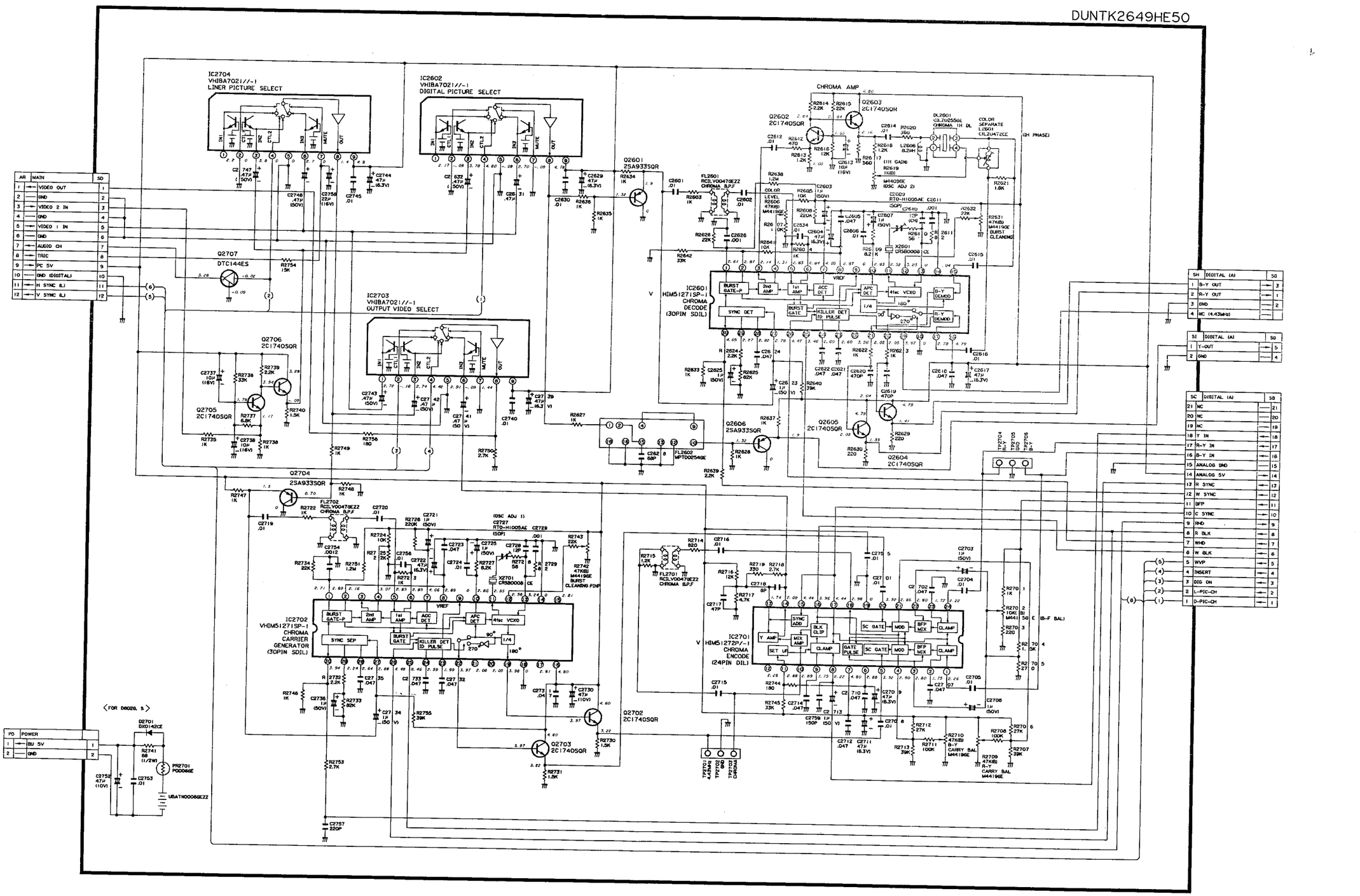


MAIN CIRCUIT (2) (VC-D805H)

Playback composite signal
Record composite signal
Video E-E signal
Audio playback signal
Audio record signal
Audio E-E signal



PWB-S, DIGITAL (B) CIRCUIT SCHEMATIC DIAGRAM



Y/C CIRCUIT

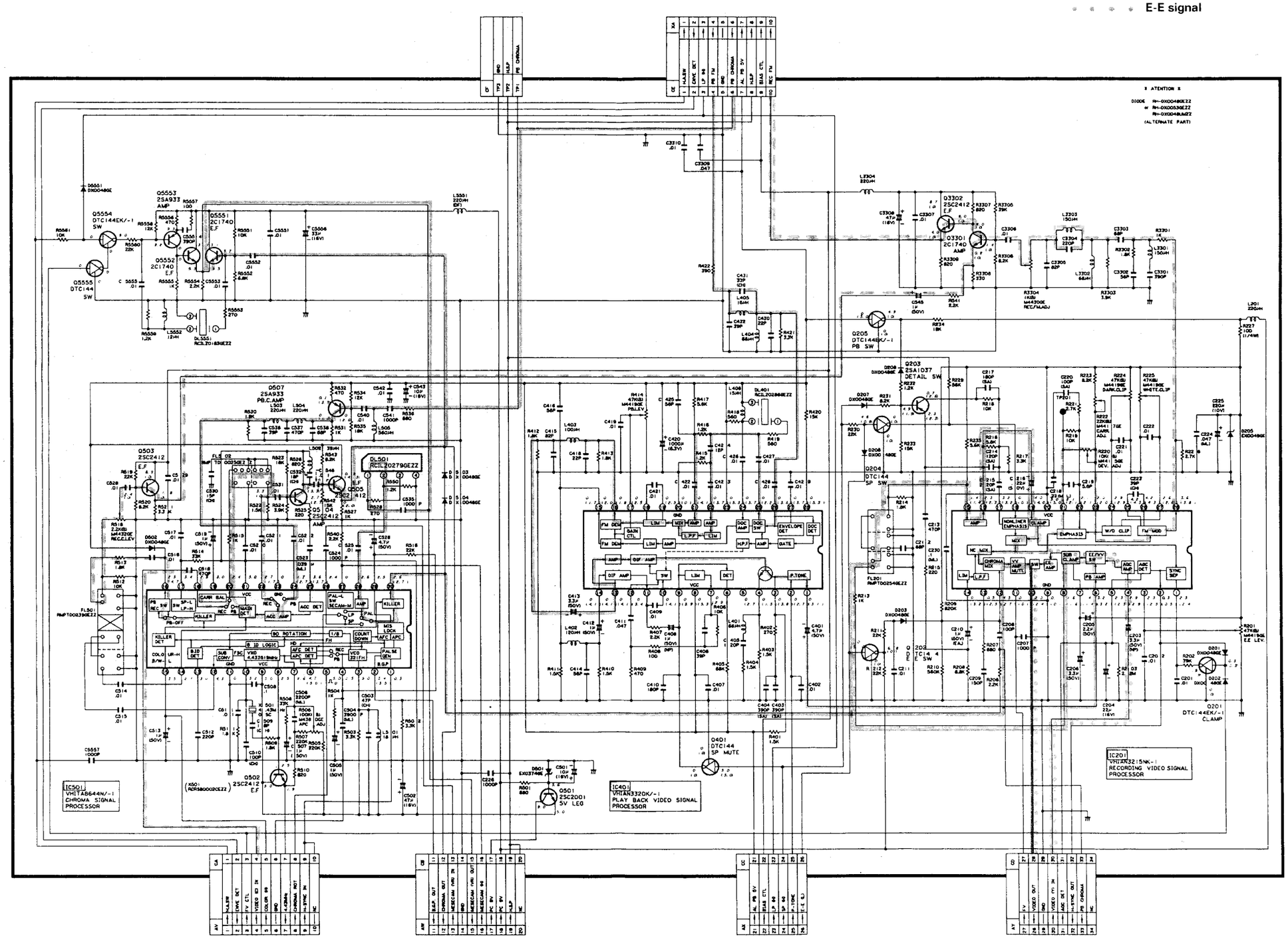
Playback chrominance signal

Record chrominance signal

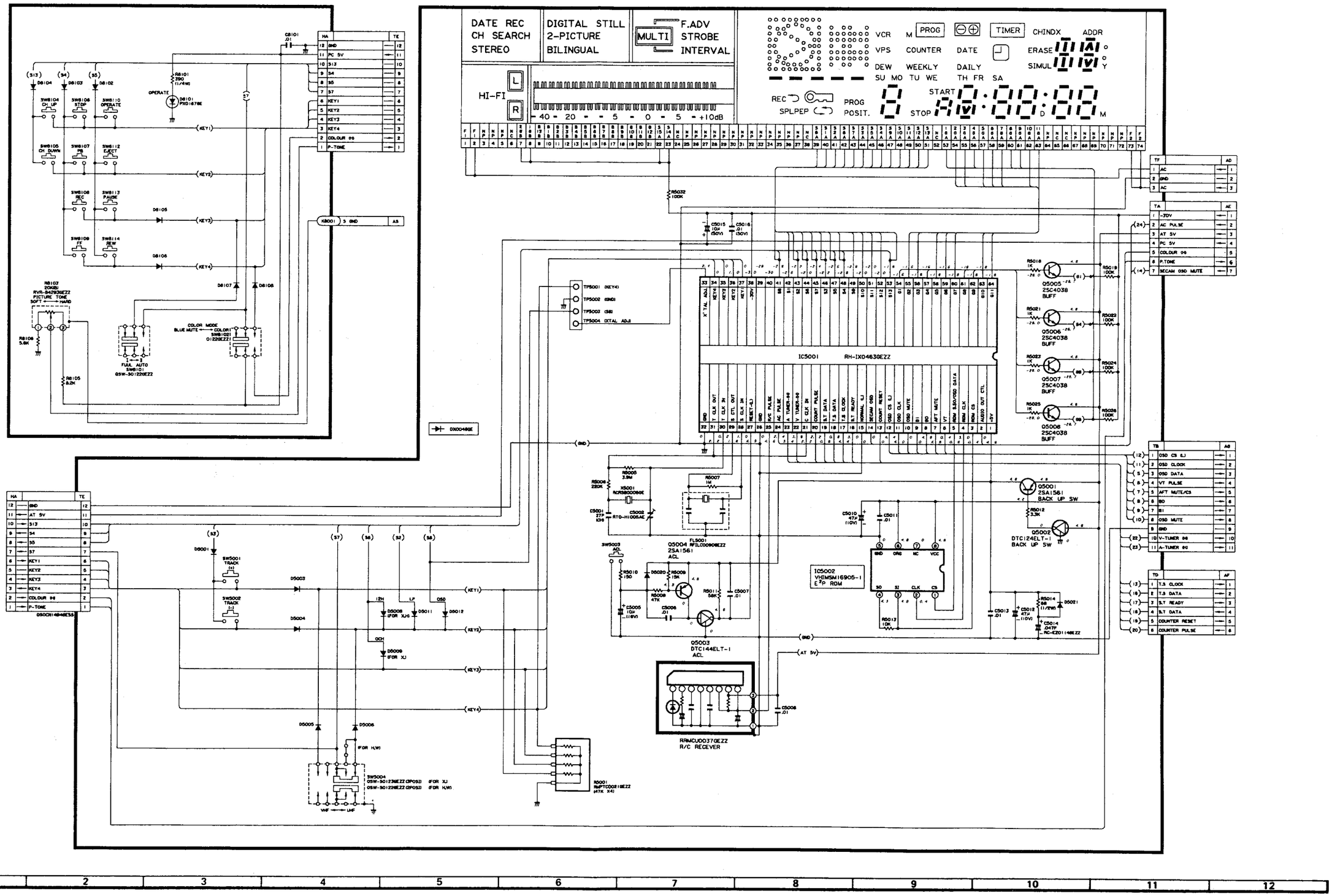
Playback luminance signal

Record luminance signal

E-E signal



TIMER CIRCUIT / OPERATION CIRCUIT



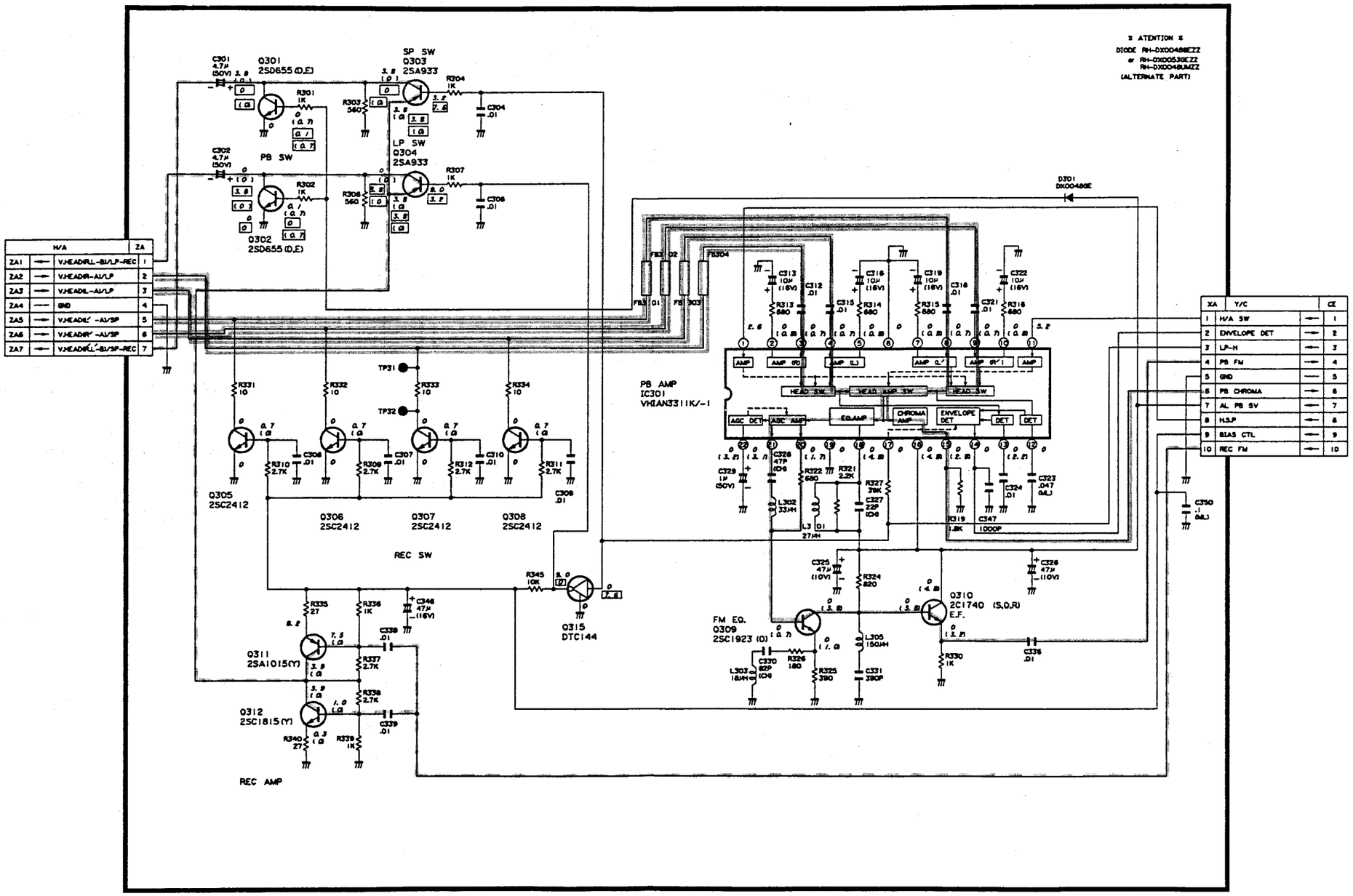
HEAD AMPLIFIER CIRCUIT

Playback chrominance signal

Playback luminance signal

Record luminance signal

Record chrominance signal

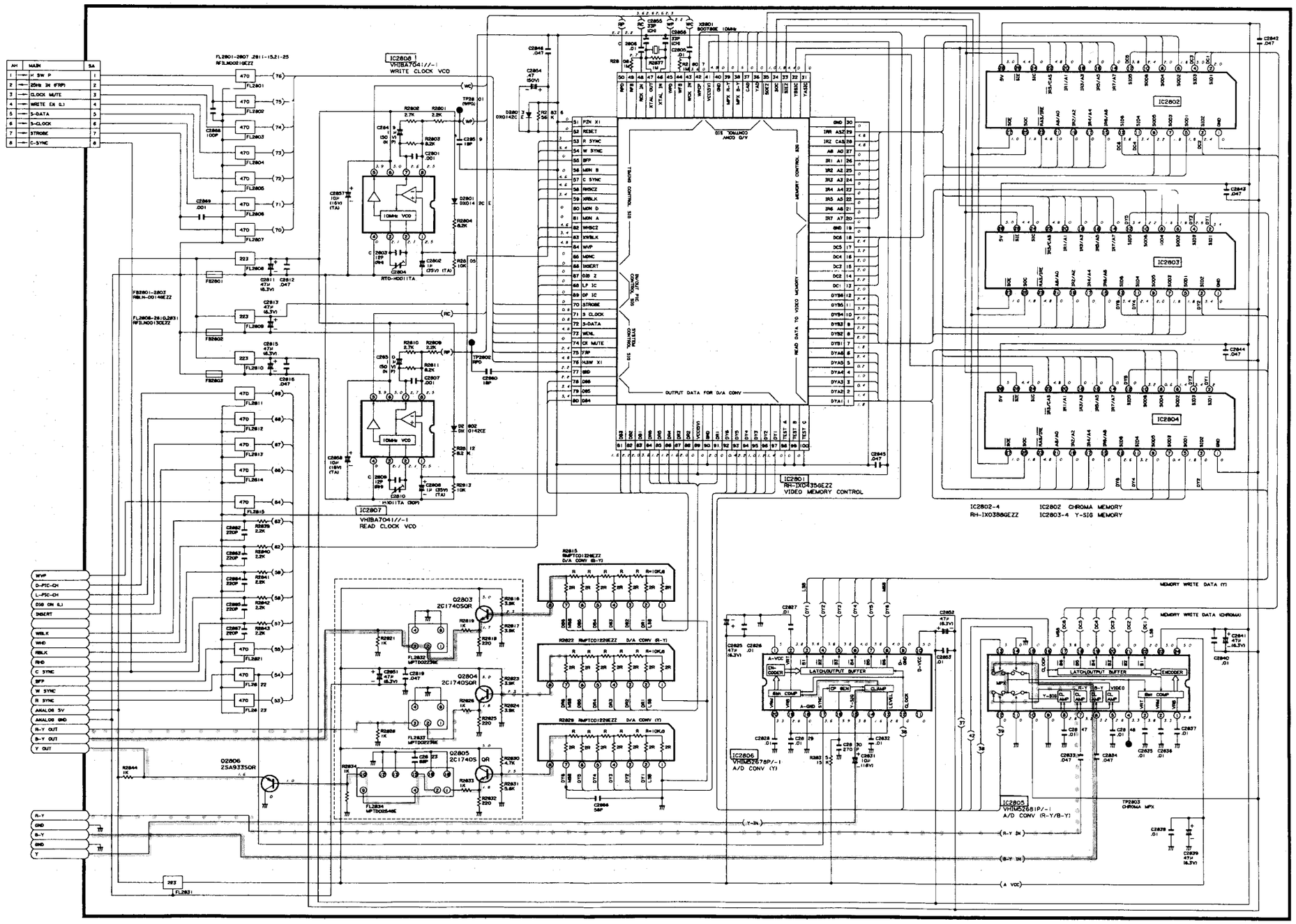


DIGITAL CIRCUIT (A)

Luminance (Y)

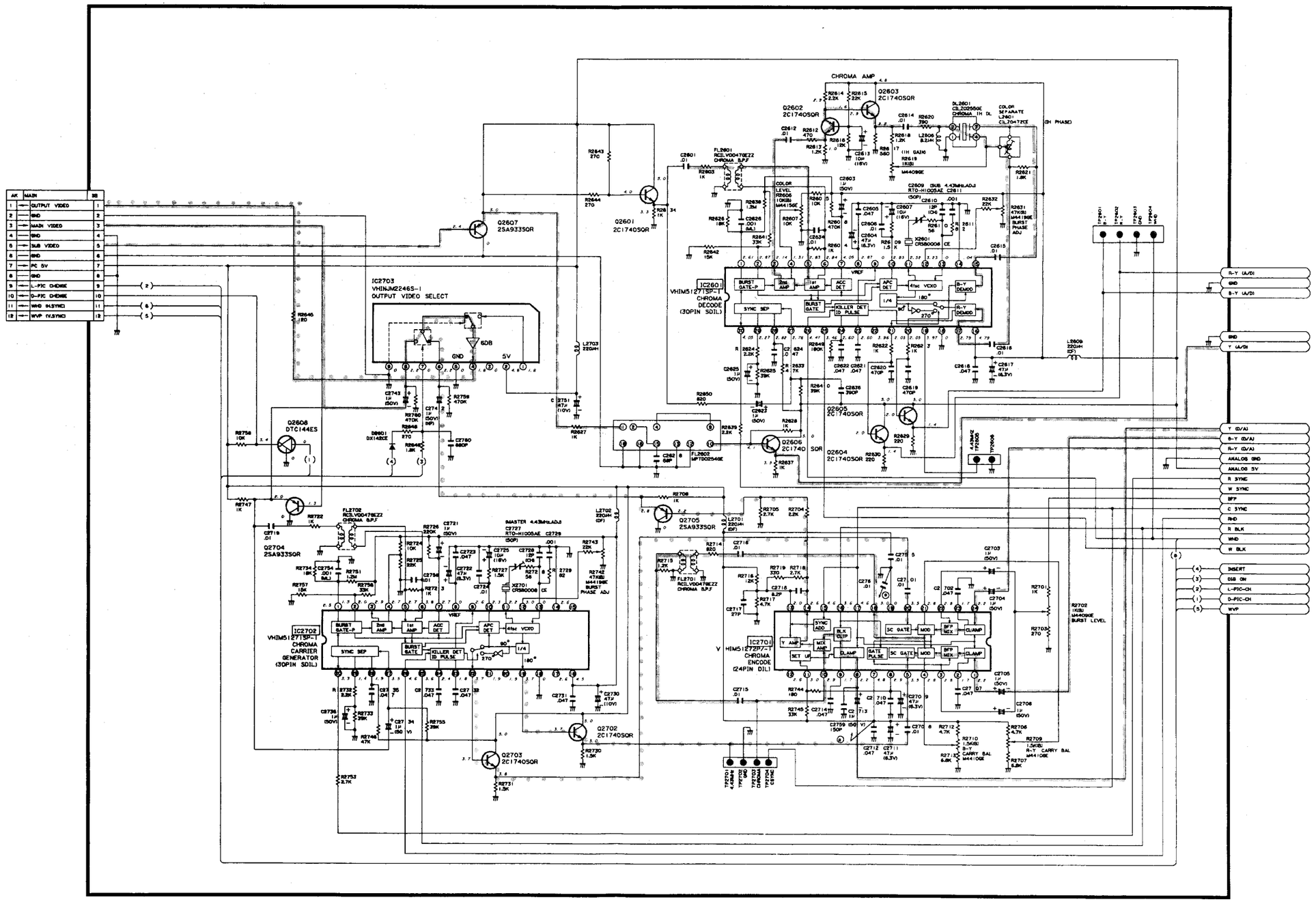
B-Y

R-Y



DIGITAL CIRCUIT (B)

Video (NOM, MAS)
Video (NOM, SUB)
Video (Digital)
Luminance
Chroma
Sub carrier
R-Y
B-Y



SERVO CIRCUIT

VC-D805H, W

Record reference signal

VC-D805H, W

Capstan frequency reference signal

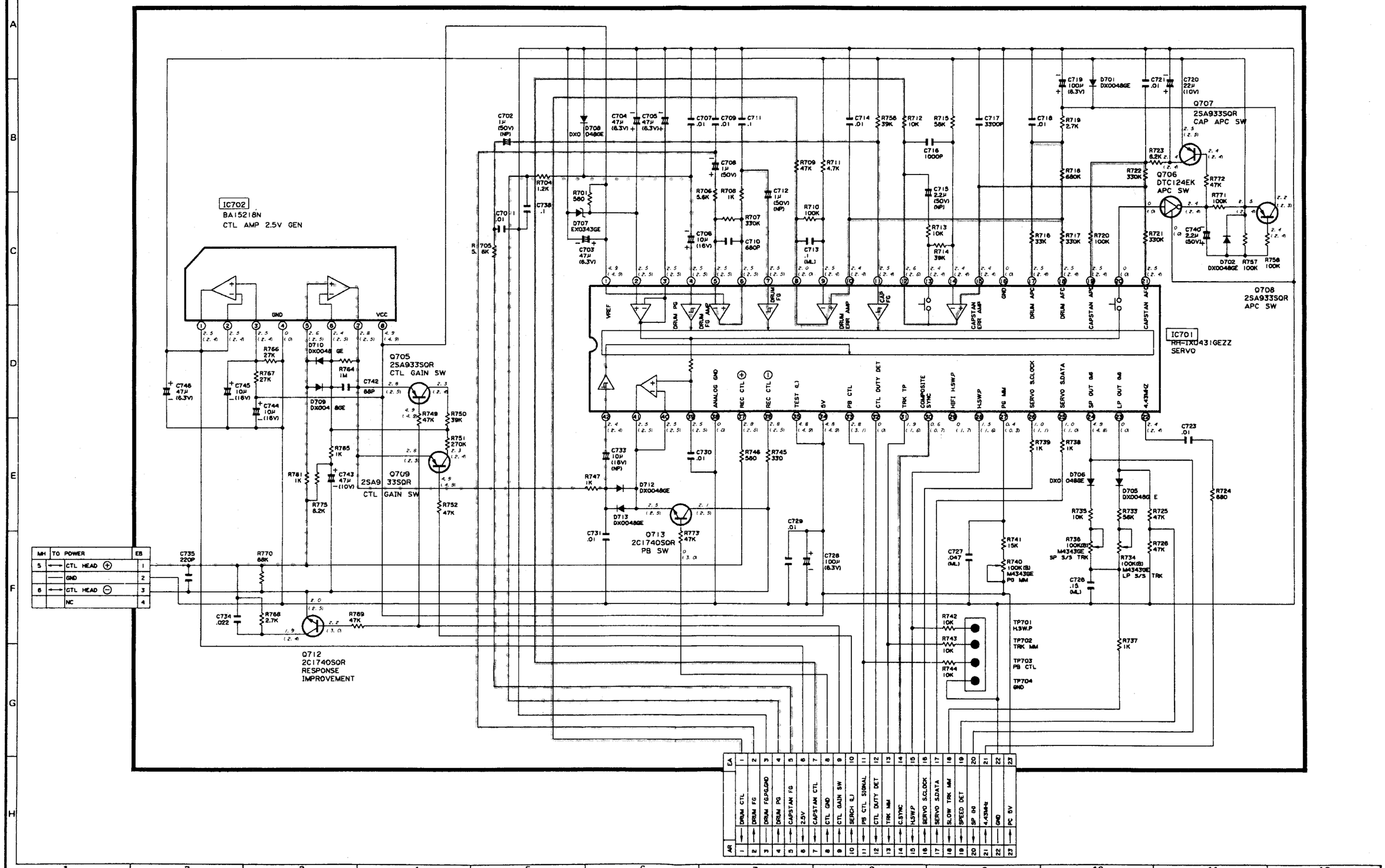
Capstan phase reference signal

Capstan control signal

Drum frequency reference signal

Drum phase reference signal

Drum control signal



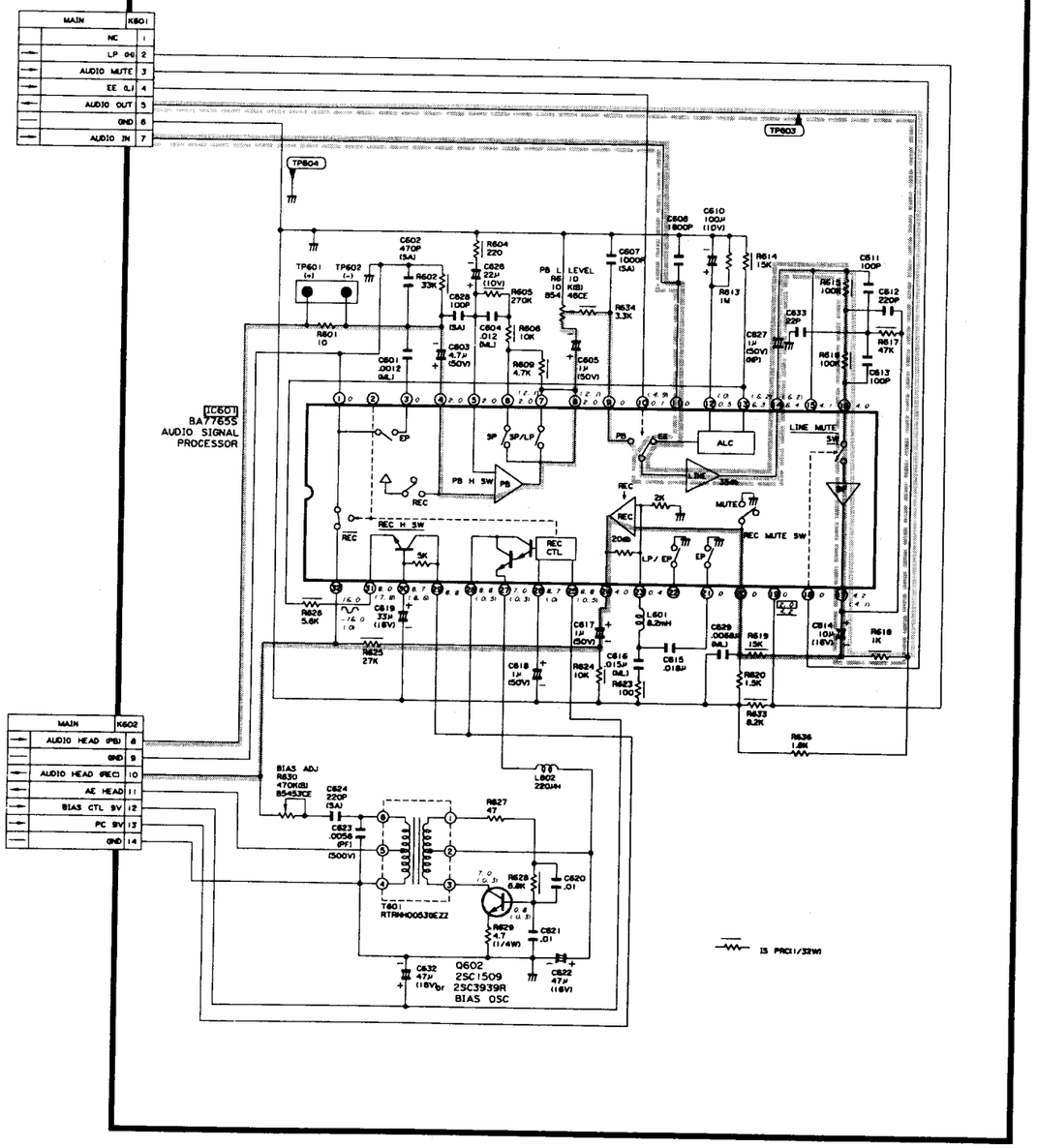
AUDIO CURCUIT

Audio Playback Signal

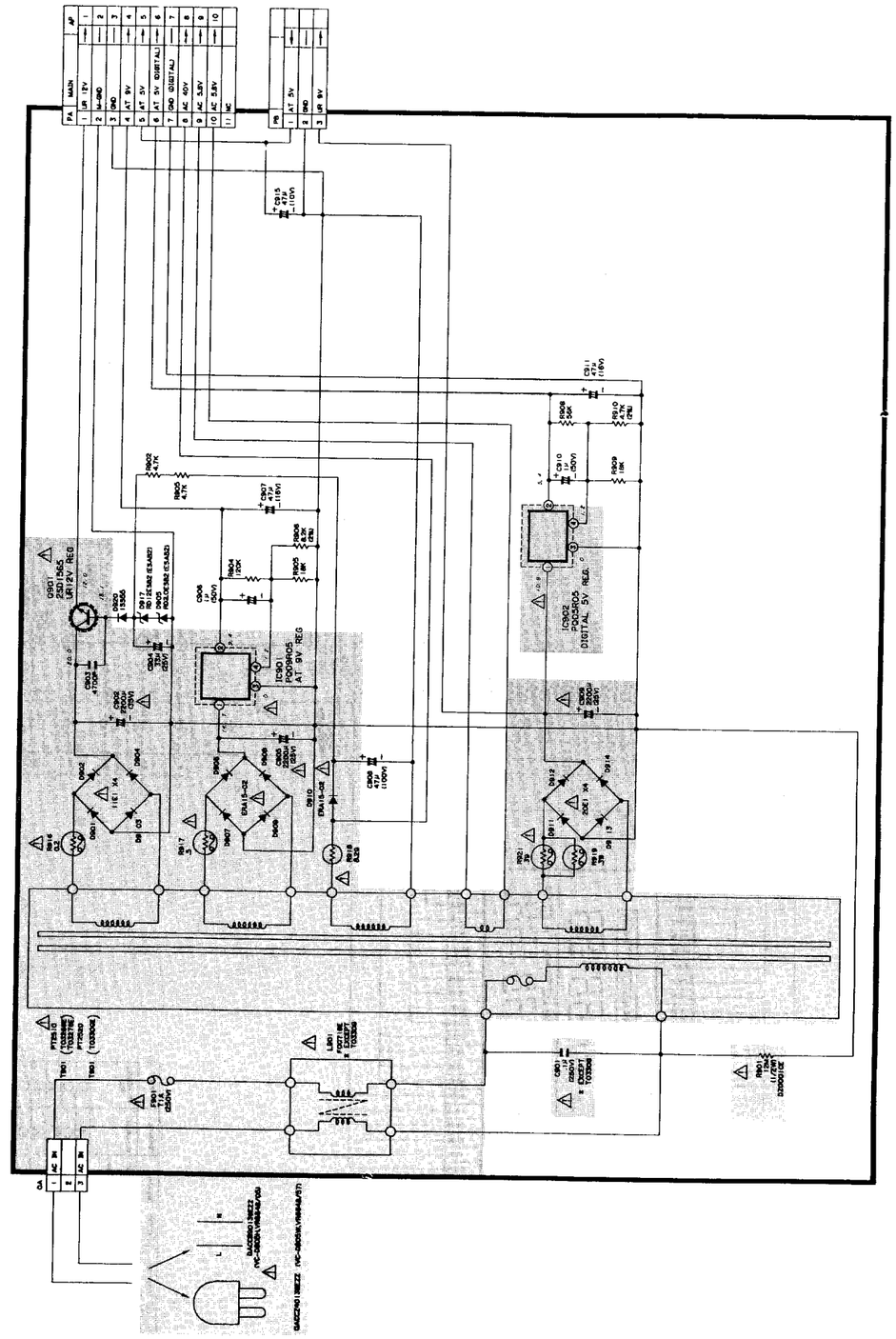
Audio Record Signal

Audio E-E Signal

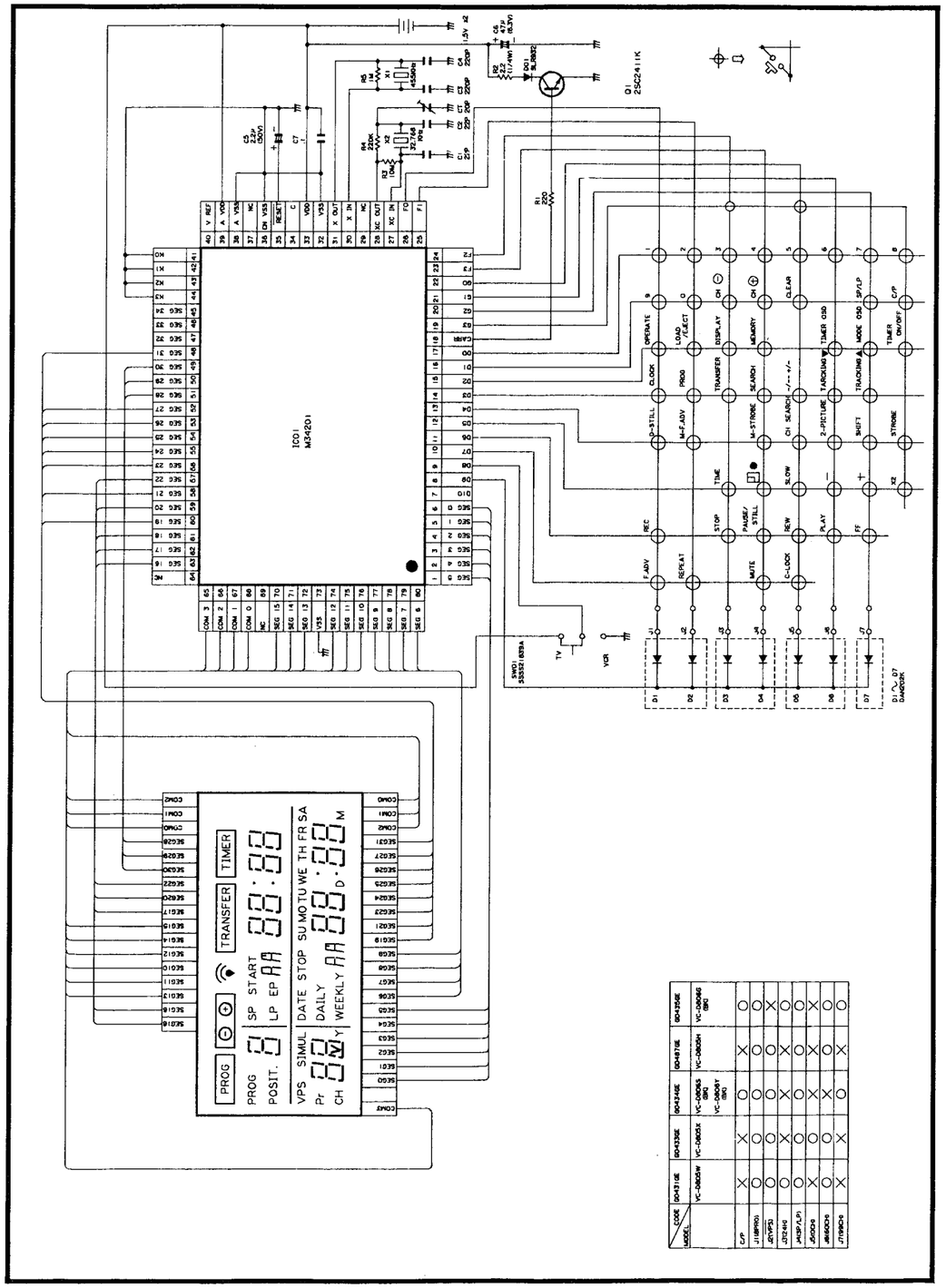
RUNTK0505GEZZ



POWER CIRCUIT



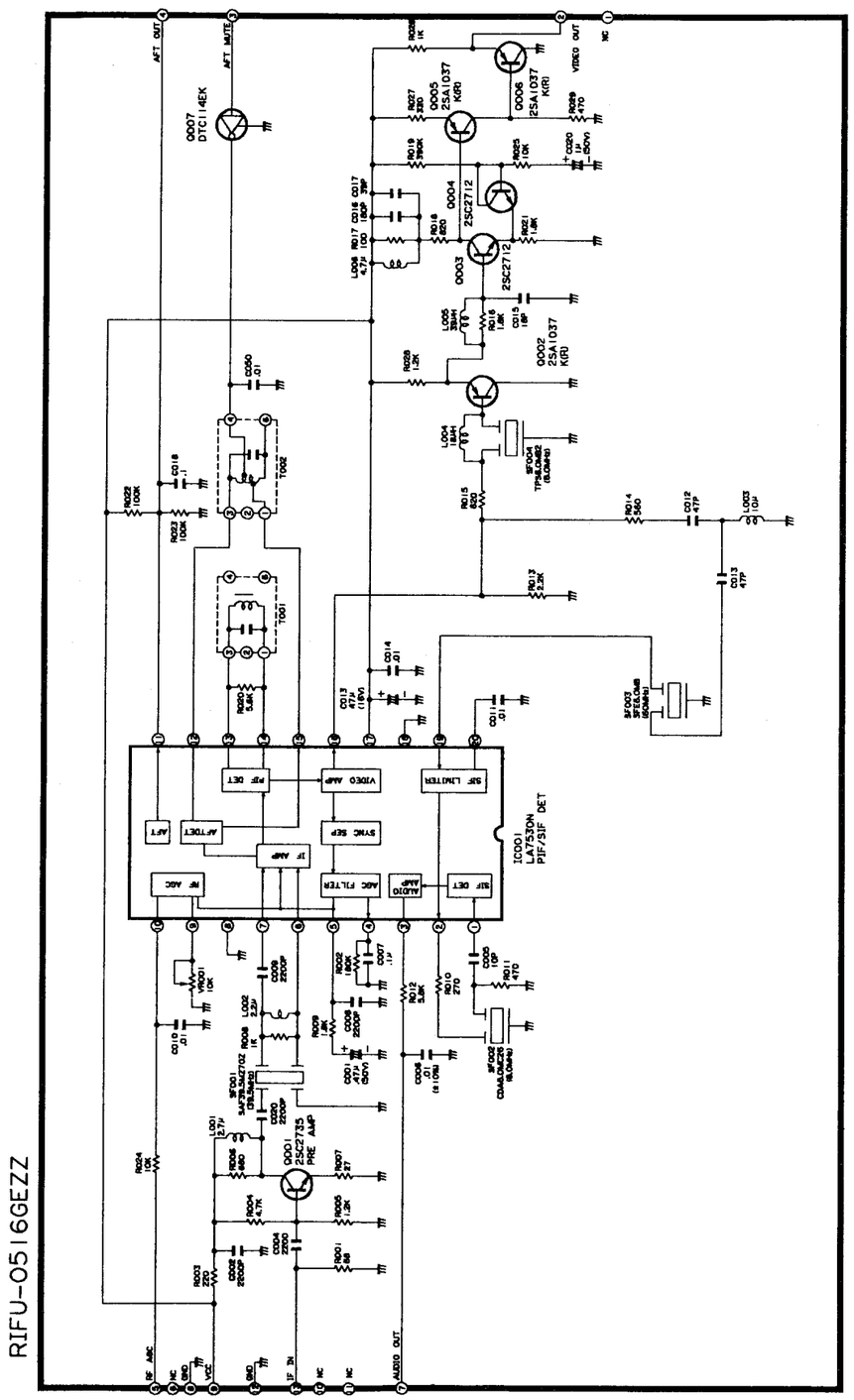
INFRARED REMOTE CONTROL CIRCUIT



CODE / MODEL	0043SE VC-D805W	0043SE VC-D805X	0043SE VC-D806S (EK)	0043SE VC-D806V (EK)	0047SE VC-D805H	0043SE VC-D806G (EK)
C/P	X	X	O	O	X	O
J1(RMIN)	O	O	O	O	O	O
J2(VPS)	O	O	O	O	O	O
J3(24H)	O	O	O	X	O	O
J4(SP/LP)	O	O	X	X	O	O
J5(CCD)	O	O	O	X	O	O
J6(CCD)	X	O	O	X	O	O
J7(RMOT)	O	X	O	X	X	O

VC-D805H, W

IF PACK CIRCUIT



MODELS **VCA105HM** **VCA111HM** **VCD805HM** **VCT310HM**

VCT510HM

SYMPTOM VCR will not fully eject tape or will not accept a tape (this may occur intermittantly).

CAUSE Faulty cassette switch.

ACTION Replace cassette switch and sensor PWB with an improved part using the part listed below.

REF NO	DESCRIPTION	PART NUMBER	PRICE CODE
-	Cassette switch PWB	DUNTK3194HEOO	AN

MODELS **VCT510HM** **VCA111HM** **VCA113HM** **VCA615HM**

VCD805HM **VCT310HM**

SYMPTOM When pressing the stop or eject button while in the play or record mode, the VCR powers down.

CAUSE The tension release lever (item 52) flexes during unlacing, causing a delay in the timing of the tension arm. The delay causes the arm to jam on the supply pole base (item 76) which upsets the unload sequence, resulting in IC801 powering down the video.

ACTION Replace the tension release lever and the relay gear drive lever using the part numbers listed below.

REF NO	DESCRIPTION	PART NUMBER	PRICE CODE
33	Relay gear drive lever	MLEVF0289GEZZ	AE
52	Tension release lever	MLEVP0133GEZZ	AC

MODELS	**VCA501H**	**VCA105HM**	**VCA111HM**	**VCA113HM**
	VCD805HM	**VCT310HM**	**VCT510HM**	

SYMPTOMS

1. The cassette carriage intermittantly ejects the tape.
2. The cassette tape gets jammmed.
3. When record mode is selected, the tape is ejected.

CAUSE The pinch roller assembly has become deformed.

ACTION Replace the pinch roller lever, using the part number given below.

REF NO	**DESCRIPTION**	**PART NUMBER**	**PRICE CODE**
25	Pinch Roller Assembly	MLEVF0281GEZZ	AN

VIDEO TECHNICAL BULLETIN

MODELS	**VCA215HM**	**VCA60HM**	**VCA615HM**	**VCD805HM**
	VCS1000H	**VCT310HM**	**VCT510HM**	

SYMPTOM Capstan motor will not rotate.

CAUSE Open circuit track due to C6 leaking. C6 is located on the capstan motor unit PWB.

ACTION Clean the PWB, repair the printed track and replace C6 with a 10uF, 25V capacitor with the part number given below.

REF NO	**DESCRIPTION**	**PART NUMBER**	**PRICE CODE**
C6	10uF, 25V	94SSEE5131713P	AD

MODELS	**VCA105HM**	**VCA111HM**	**VCA5011HM**	**VCD801H**
	VCD805HM	**VCT310HM**		

ACTION If the ealier processor (TA8644N) is fitted in the place of the later processor (TA8644N-B) then D502 must be replaced using the part number given below.

The diode is fitted in series with pin 16 of IC501 with its cathode pointing towards pin 16.

REF NO	**DESCRIPTION**	**PART NUMBER**	**PRICE CODE**
D502	Diode	VHDISS198//-1	AB

MODELS **VCA111HM** **VCA105HM** **VCD805HM** **VCT310HM**

VCT510HM

REASON Improvements to the mechanism during production. These parts are not inter-changeable with parts fitted before serial number xxxxxxx (see technical report).

ACTION Add the parts listed below to the service manaul.

REF NO	DESCRIPTION	PART NUMBER	PRICE CODE
63	Take up loading A'ssy	MLEVF0304GEZZ	AC
65	Supply loading arm Assy	MLEVF0303GEZZ	AC
72	Take up pole base slide	MSLIF0049GEFW	AB
73	Take up pole base A'ssy	LPOLM0037GEZZ	AG
75	Supply pole base slider	MSLIF0048GEFW	AB
76	Supply pole base A'ssy	LPOLM0036GEZZ	AG